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No. _____

IN THE

Supreme Court of the United States

OCTOBER TERM, 1980

WEIDMAN METAL MASTERS CO., INC.,
Petitioner,

v.

GLASS MASTER CORPORATION
and FRED F. WILLSON,
Respondents.

PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FIFTH CIRCUIT

RODNEY KENT CALDWELL
ARNOLD, WHITE & DURKEE
2100 Transco Tower
Houston, Texas 77056
(713) 621-9100

Of Counsel:

JOHN D. NORRIS
MARY ALLEN DENT
ARNOLD, WHITE & DURKEE
2100 Transco Tower
Houston, Texas 77056
(713) 621-9100

Alpha Law Brief Co., One Main Plaza, No. 1 Main St., Houston, Texas 77002

QUESTIONS PRESENTED

(1) Whether a trial court's determination as to patent infringement and its concomitant determination as to equivalence between the patented invention and an accused infringing device are findings of fact reversible only if clearly erroneous.

(2) Whether a reviewing court may substitute its construction of patent claims and affirm a holding of validity without providing for reassessment of the basic factual inquiries necessary for a determination of obviousness.

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PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FIFTH CIRCUIT

The petitioner, Weidman Metal Masters Co., Inc.,* respectfully prays that a writ of certiorari issue to review the judgment and opinion of the United States Court of Appeals for the Fifth Circuit entered in this case on August 13, 1980.

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* The parties to the proceeding before the United States Court of Appeals for the Fifth Circuit were only those appearing in the caption. There exist no parent corporations, subsidiaries, or affiliates of the petitioner, Weidman Metal Masters Co., Inc.

OPINIONS BELOW

The findings of fact and conclusions of law of the United States District Court for the Southern District of Texas, Houston Division (App. A, *infra*) are not officially reported. The opinion of the United States Court of Appeals for the Fifth Circuit (App. B, *infra*) is reported at 623 F.2d 1024.

JURISDICTION

The judgment of the Court of Appeals reversing the District Court was entered on August 13, 1980. A Petition for Rehearing and a Petition for Rehearing En Banc were both timely filed on August 27, 1980. Both of these petitions were denied on October 3, 1980. This Court's jurisdiction is invoked under 28 U.S.C. § 1254(1).

QUESTIONS PRESENTED

(1) Whether a trial court's determination as to patent infringement and its concomitant determination as to equivalence between the patented invention and an accused infringing device are findings of fact reversible only if clearly erroneous.

(2) Whether a reviewing court may substitute its construction of patent claims and affirm a holding of validity without providing for reassessment of the basic factual inquiries necessary for a determination of obviousness.

CONSTITUTIONAL AND STATUTORY PROVISIONS AND RULES INVOLVED

Constitution of the United States: Article 1, Section 8, Clause 8.

The Congress shall have power . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

Statutes:

35 U.S.C. § 103 provides:

§ 103. Conditions for patentability; non-obvious subject matter.

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

35 U.S.C. § 271 provides in part:

(a) Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.

35 U.S.C. § 281 provides:

A patentee shall have remedy by civil action for infringement of his patent.

Rule 52 of the Federal Rules of Civil Procedure provides in part:

(a) Effect. In all actions tried upon the facts without a jury or with an advisory jury, the court shall

find the facts specially and state separately its conclusions of law thereon, and judgment shall be entered pursuant to Rule 58; and in granting or refusing interlocutory injunctions the court shall similarly set forth the findings of fact and conclusions of law which constitute the grounds of its action. Requests for findings are not necessary for purposes of review. Findings of fact shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses. The findings of a master, to the extent that the court adopts them, shall be considered as the findings of the court. If an opinion or memorandum of decision is filed, it will be sufficient if the findings of fact and conclusions of law appear therein. Findings of fact and conclusions of law are unnecessary on decisions of motions under Rules 12 or 56 or any other motion except as provided in Rule 41(b).

STATEMENT OF THE CASE

Petitioner, Weidman Metal Masters Co. (Weidman), sued Glass Master Corporation (Glass Master) and Fred F. Willson (Willson) for a declaratory judgment. Weidman sought a declaration that U.S. Patent No. 3,605,534, issued to Barr, was invalid or not infringed by Weidman's Fiber Dragon duct board cutting machines. The case was filed pursuant to 28 U.S.C. §§ 2201-2 with jurisdiction founded on 28 U.S.C. § 1338(a). Glass Master and Willson counterclaimed for patent infringement under 35 U.S.C. §§ 271, 281 with jurisdiction founded on 28 U.S.C. § 1338(a).

The patent involved in the infringement suit relates to machines for cutting duct board, a fibrous insulation board of matted fiberglass held together by a suitable

binder and having a vapor barrier such as aluminum foil on one side. Flat sheets of duct board are cut to size, "grooved," and formed into rectangular ducts for use in central air conditioning and heating systems. Grooves are formed by cutting strips of insulation from the fiberglass side of the board without damaging the foil vapor barrier. After removal of insulation strips, the board can be folded into the desired shape and the edges can be sealed to form a duct section. The duct sections thus formed are joined together to make up the heating or air conditioning duct system.

In the early 1960's, hand-held cutting tools were used to cut grooves in duct board. As the use of duct board increased and improved products became available, machines were developed to reduce hand labor. By 1965 machines were available which held the duct board in a fixed position while cutting tools, mounted on a supporting tool bar, were drawn across the duct board to cut several grooves. Another machine, the Forrest machine (made by the Howard C. Forrest Company), became available in late 1965. The Forrest machine had fixed-in-place cutters mounted on a support, and front and rear pairs of feed rollers on opposite sides of the support for feeding a sheet of duct board across the cutters. Each of the cutters included at least one knife blade formed to produce the desired cut in the board. A guide roller located on the opposite side of the board from the cutters held the board against the cutting blades as the board moved across the cutters. The knife blades were located so as to make the deepest part of their cuts in the board just behind the center line of the guide roller. Although the cutters provided with the Forrest machine were designed to cut triangular grooves in the duct board, the

record established that the Forrest machine could be adapted to cut shiplap grooves by changing the shape of the cutters.

Some installers believe that shiplap grooves have advantages over triangular grooves in the formation of square corners for rectangular shaped duct. The patent in suit (U.S. Patent No. 3,605,534, sometimes referred to as the '534 patent, App. C, *infra*) is directed to a machine for cutting several shiplap grooves in a single passage of the duct board through the machine. The patent discloses a machine having cutters mounted on a tool bar, front and rear pairs of feed rollers mounted on opposite sides of the tool bar for feeding a sheet of duct board across the cutters, and a blade support roller positioned directly beneath the cutters. Each of the cutters includes at least one knife blade formed to produce the desired cut in the board and a carrier for mounting the blade on the tool bar. The patent teaches that each of the knife blades includes a flat lowermost section and a second section between the lowermost section and the carrier. The second section makes the blade resilient and prevents the blade support roller from exerting excessive force on the lowermost flat section of the knife blade. In operation, the board passes between the cutter and the blade support roller. The resilient knife blade cooperates with the support roller to make a deep cut-out of insulation without tearing the foil barrier.

The tool bar and the support roller are beams supported from each end, and they will bend more near the center of the machine than near the ends. This resilience in the tool bar and support roller makes it difficult to obtain a uniformly deep cut-out of insulation without

tearing the foil. The solution to this problem taught by the '534 patent is to provide a resilient means in either the knife blades or the mounting of the support roller so that the lowermost section of the knife blades will be biased or spring-loaded against the fold while being supported by the support roller as the duct board is grooved.

The specification of the '534 patent suggests that the resilient means necessary for operation might be provided by somehow resiliently mounting the support roller, but no such structure is disclosed and all of the knife blades shown for making the deep cuts include the second section as taught by the patent for providing resilience.

The patent teaches in great detail the importance of positioning the lowermost flat sections of the knife blades directly over the blade support roller so that those sections of the knife blades engage the blade support roller when there is no duct board in the machine. Further, the patent emphasizes the importance of positioning the blade support roller in the fore and aft direction relative to the lowermost flat sections of the knife blades in such a way that the roller engages the flat sections of the blades about 1/8 inch to 1/4 inch rearward of the frontmost cutting edge of those sections. In this regard, the patent teaches that positioning the blade support roller either too far forward or too far rearward will result in unsatisfactory operation.

Application for the '534 patent was filed in May 1967. The '534 patent is owned by Willson, and Glass Master is Willson's exclusive licensee. Weidman built its first duct board cutting machine in 1972 and began production of its Fiber Dragon machines (the accused infringing machines) in 1973.

The trial in this case was to the court and lasted for seven days. The trial court judged the credibility of the witnesses and observed both the prior art Forrest machine and the accused Fiber Dragon machine in operation. At the end of trial, the court announced its judgment of non-infringement and ordered dismissal of the counterclaim. On April 28, 1978, the trial court entered judgment.

The trial court found a number of differences between the invention claimed in the '534 patent and the accused Fiber Dragon machine, including the following two fundamental differences:

> (1) The patent claims a knife blade positioned over the roller, while Weidman's knife blade is positioned below and behind top center of the roller.
>
> (2) The patent claims that either the knife blades or the roller provides resiliency during cutting to prevent the roller from exerting excessive force on the knife blades. Weidman's machine contains rigid blades and neither its blades nor its roller provides the resilient means recited in the claims.

The trial court made a number of other findings directed to differences between the invention claimed in the '534 patent and the accused Weidman machine and to similarities between the Weidman machine and the prior art Forrest machine, including the following:

> (1) The method of cutting of the patented machine was "substantially different" from the method of cutting employed by the Weidman machine. [Excerpts from Supplemental Transcript, February 21, 1978, Part I, page 13-14 (App. D)].

(2) The Weidman machine and the prior art Forrest machine "both do the same thing in the same way." [Excerpts from Supplemental Transcript, February 21, 1978, Part II, page 29 (App. E)].

(3) "There is no infringement of the claims of the patent in suit under the doctrine of equivalents because the accused device includes no elements which are the equivalent of 'blade support means,' 'support roller,' or 'resilient means' as those terms are used in the specification and claims of the patent in suit." [App. A at 13].

(4) "The mode of operation in the structure of the accused [Weidman] machines differs significantly from the Barr [patented] device, and the accused machines function in a different manner from that disclosed and claimed in the '534 patent." [App. A at 14].

Glass Master and Willson appealed the judgment of noninfringement to the Court of Appeals for the Fifth Circuit. In an opinion entered August 13, 1980, the Fifth Circuit reversed the trial court's finding of noninfringement and affirmed the holding of validity (entered by the trial court with respect to the narrower scope it had afforded the patent). In at least one respect, the Fifth Circuit agreed with the trial court's finding on infringement. The court of appeals also agreed that at least one of the descriptions set forth in claim 1 is not literally infringed. The last paragraph of claim 1 requires that either the knife blade means or the blade support means include "resilient means" to avoid excessive force on the knife blade, which force would result in piercing the foil vapor barrier. The court of appeals indicated that the

Weidman machine includes no resilient means in either the knife blade or blade support. Agreeing with the district court as to the absence of literal infringement, the court stated:

> Although we do not necessarily subscribe to his entire interpretation of each claim, and we are mindful that the interpretation of the patent is a question of law, we find his reading of salient portions of each claim legally correct, and we do not find erroneous the factual conclusion that the claim, thus read is not literally infringed.

623 F.2d at 1029.

However, in applying the doctrine of equivalents to the claims of the '534 patent, the court of appeals, without rejecting the trial court's findings of fact as clearly erroneous, reversed because in its view the trial court had erred in its construction of the claim.

REASONS FOR GRANTING THE WRIT

1. The Decision Below Directly and Irreconcilably Conflicts With Decisions of This Court on the Determination of Equivalence and the Standard of Review for That Determination

It has long been held by this Court that the determination of patent infringement is a question of fact. *United States v. Esnault-Pelterie,* 299 U.S. 201 (1936); *Coupe v. Royer,* 155 U.S. 565 (1895); *Winans v. Denmead,* 56 U.S. (15 How.) 330 (1853). When this Court first announced the doctrine of equivalents over a century ago in *Winans,* equivalence was considered just as much a finding of fact as was literal infringement. This Court's

last statement on the doctrine of equivalents very clearly established that a determination of equivalence between a patented invention and an accused device is a finding of fact. In *Graver Tank & Manufacturing Co. v. Linde Air Products Co.*, 339 U.S. 605, 609-10 (1950), this Court said:

> A finding of equivalence is a determination of fact. Proof can be made in any form: through testimony of experts or others versed in the technology; by documents, including text and treaties; and, of course, by the disclosures of the prior art. Like any other issue of fact, final determination requires a balancing of credibility, persuasiveness and weight of evidence. It is to be decided by the trial court and that court's decision, under general principles of appellate review, should not be disturbed unless clearly erroneous. Particularly is this so in a field where so much depends upon familiarity with specific scientific problems and principles not usually contained in the general storehouse of knowledge and experience.

The court of appeals, early in its opinion, noted the rule of this Court since *Winans*, that patent construction is a question of law and infringement is a question of fact. The court stated:

> The principles that guide us have been frequently stated and restated. We sum them up without lengthy citation. The validity of a patent and its interpretation are both questions of law. Each may depend upon factual inquiries. After the proper construction of a patent is determined, whether the patent, thus interpreted, has been infringed is a question of fact.

623 F.2d at 1025. However, toward the end of its opinion the court of appeals stated:

> Normally infringement is a question of fact. . . . . However, in this case, the critical analysis provided by the district judge involved the construction of the patent. When this is so legal questions are intertwined with the factual issues and we are not strictly limited by the clearly erroneous standard in our review.

623 F.2d at 1030. The court of appeals then not only differed with the trial court as to the proper construction of the claims, but also substituted its own findings of fact as to infringement and equivalence with respect to the newly construed claims.

The court of appeals statement, that the clearly erroneous standard did not strictly bind it because the factual issues intertwined with legal questions, renders meaningless the principle that patent infringement and equivalence determinations are findings of fact. Every determination as to infringement, whether literal infringement or by way of equivalence, first requires a proper construction of the patent claims. Therefore, the Fifth Circuit's position in this case, that the clearly erroneous standard does not apply because claims must be construed before a finding on infringement, turns every question of infringement into a question of law. Such a position irreconcilably conflicts with this Court's decision on the standard of review of infringement determinations, and particularly with the statement of this Court in *Graver Tank* that "[a] finding of equivalence is a determination of fact." 339 U.S. at 609.

The Fifth Circuit never stated that any of the findings of fact of the trial court were clearly erroneous, but rather stated only that the trial judge had erred in its

construction of the patent claims. Although it differed with the trial court on the question of law respecting claim construction, the Fifth Circuit did not remand for further findings with respect to the newly construed claims; rather, it proceeded to make its own determinations respecting infringement and equivalence. Such action failed to give effect to the trial court's findings of fact. This action is particularly troublesome because the trial court had the opportunity to judge credibility of witnesses and to view both the accused Fiber Dragon machine and the prior art Forrest machine.

The approach taken in this case with respect to the clearly erroneous standard has implications far beyond matters involving patent infringement and equivalence. The Fifth Circuit's treatment of the trial court's factual findings in this case directly and irreconcilably conflicts with recent statements of this Court regarding the clearly erroneous standard of Rule 52(a). For example, this Court stated in *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 123 (1969):

> In applying the clearly erroneous standard to the findings of a district court sitting without a jury, appellate courts must constantly have in mind that their function is not to decide factual issues *de novo*. The authority of an appellate court, when reviewing the findings of a judge as well as those of a jury, is circumscribed by the deference it must give to decisions of the trier of fact, who is usually in a superior position to appraise and weigh the evidence.

These direct and irreconcilable conflicts with this Court's decisions on equivalence and the standard of review for that determination compel granting of certiorari.

2. The Decision Below Directly and Irreconcilably Conflicts With Decisions of This Court on the Necessity for Basic Factual Inquiries Prior to Resolving Obviousness

The decision below conflicts with yet another fundamental principle enunciated by this Court. The Fifth Circuit in its opinion agreed with the determination of the trial court on the validity of the '534 patent (as its claims were construed by the trial court). The Fifth Circuit, however, in affirming validity, construed the claims more broadly without reviewing by the proper standard the factual findings necessary to the issue of obviousness.

The conditions of patentability set out in Title 35 of the United States Code require in addition to novelty and utility, nonobviousness of the subject matter sought to be patented. The criteria for nonobviousness are set forth in 35 U.S.C. § 103:

> § 103. Conditions for Patentability; Non-obvious subject matter
>
> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This Court spelled out the factual inquiries necessary for determination as to obviousness in its landmark deci-

sion of *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966) (emphasis added), as follows:

> While the ultimate question of patent validity is one of law, . . . the § 103 condition, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; *differences between the prior art and the claims at issue are to be ascertained;* and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

By giving the claims a broadened construction, the court of appeals destroyed the basis for the factual determination of the differences between the prior art and the claims. The court of appeals did not determine anew the factual findings required by *Graham* to sustain the patent's validity, and indeed it would have been inappropriate for the court of appeals to find such facts in the first instance. In light of the broadened construction of the claims by the court of appeals, the case should have been remanded to the trial court with instructions to reassess validity in light of this new construction and to make the factual determinations necessary to that reassessment. When the court of appeals reconstrued the claims in considering infringement without provision for re-consideration of validity in view of the new construction, it violated the fundamental principle that "claims of a patent must be construed in the same manner for determining validity as for determining infringement." *Lerner v. Child Guidance Products, Inc.*, 547 F.2d 29, 31 (2d Cir. 1976).

These direct and irreconcilable conflicts with this Court's decisions on the necessity for basic factual inquiries required for determining obviousness justify granting certiorari.

3. The Decision Below Conflicts With the Decisions of Other Courts of Appeals On Equivalence and the Standard of Review of a Trial Court's Determination as to Infringement and Equivalence

Since this Court's last statement on the doctrine of equivalents in *Graver Tank,* interpretations of that case by the courts of appeals reflect a great deal of conflict and confusion. While some circuit courts have erratically applied various so-called "exceptions" to avoid the clear error standard of Rule 52(a), other circuit courts have treated as clear and unequivocal the holding of *Graver Tank* with its accompanying constraints of the clear error standard. This group of circuits apparently includes the Fourth, Sixth, and Eighth Circuits.

As an example, in the recent Fourth Circuit case of *Marino Systems, Inc. v. J. Cowhey & Sons, Inc.,* 631 F.2d 313, 315 (4th Cir. 1980), the court stated as follows:

> The question of infringement generally is a question of fact and, therefore, we are constrained by *Rule* 52(a), Federal Rules of Civil Procedure, to affirm the district court's findings unless "clearly erroneous". . . . This standard on review applies to the determination of whether an accused device is within the language of a claim in a patent (literal infringement), . . . as well as to the determination of whether there is infringement under the doctrine of equivalents. . . . Marino contends, however, that

> we should apply full appellate review in this case because there was no "real dispute" as to the facts, that the district court essentially made its legal conclusions wholly upon a comparison of the structures of the devices and on the basis of documentary evidence.
>
> We disagree. Although the identity and structure of the devices in question was not disputed, and the experts testified by way of affidavit, it is apparent that the trial court indeed made factual determinations.

The Fourth Circuit went on to note that even though all of the evidence was documentary, some of the evidence was contradictory, and the circuit court's function was to defer to the district court's determination unless there appeared clear error. 631 F.2d at 315-16.

The Sixth Circuit applies rather consistently the clear error standard to determinations of literal infringement and the existence of equivalence, whether the court is affirming or reversing. *Bolkcom v. Carborundum Co.*, 523 F.2d 492 (6th Cir. 1975), *cert. denied*, 425 U.S. 951 (1976); *Olympic Fastening System, Inc. v. Textron, Inc.*, 504 F.2d 609 (6th Cir. 1974), *cert. denied*, 420 U.S. 1004 (1975).

The Eighth Circuit appears to follow the holding of *Graver Tank* relatively closely and has, in two reported cases, affirmed the district court findings with respect to infringement and application of the doctrine of equivalents. The opinions indicate that infringement based on equivalence is a factual determination subject either to the clear error standard of review or to consideration of whether the finding has substantial support in the

evidence. *Farmhand, Inc. v. Lahman Manufacturing Co.*, 568 F.2d 112 (8th Cir.), *cert. denied*, 436 U.S. 913 (1978); *Calmar, Inc. v. Cook Chemical Co.*, 336 F.2d 110 (8th Cir. 1964), *rev'd on other grounds sub. nom. Graham v. John Deere Co.*, 383 U.S. 1 (1966).

Other circuit courts either ignore the clear and unequivocal statements in *Graver Tank* or apply erratic, unpredictable and irreconcilable "exceptions" to the status of infringement and equivalence as questions of fact. In *Georgia-Pacific Corp. v. United States Plywood Corp.*, 258 F.2d 124 (2d Cir.), *cert. denied*, 358 U.S. 884 (1958), the Court of Appeals for the Second Circuit first reversed the district court on the proper construction of the patent claim at issue and then applied the doctrine of equivalents to find infringement that was not found by the district court. The Second Circuit in that case made no direct references to the appropriate standard of review for infringement or determinations of equivalence, but simply stated its conclusion that the claim at issue was valid and infringed.

One confused and erratically applied "exception" to the question of infringement being one of fact is that applied periodically in the Ninth Circuit. In *Kemart Corp. v. Printing Arts Research Laboratories, Inc.*, 201 F.2d 624, 627 (9th Cir. 1953) (footnotes omitted), the Ninth Circuit stated:

> Appellee urges that the trial court's finding of infringement was a finding of fact, not to be disturbed unless clearly erroneous. However, it is well settled that where, as here, there is no dispute as to the evidentiary facts, and the record and exhibits enable us to clearly comprehend the nature both of the process patented and the alleged infringing process,

> the question of infringement resolves itself into one of law, depending upon a comparison between the two processes and the correct application thereto of the rule of equivalency.

Such treatment of equivalence as a question of law stands in stark contrast to the statement in *Graver Tank* that it is a finding of fact. This position was repeated by the Ninth Circuit in *Kwikset Locks, Inc. v. Hillgren*, 210 F.2d 483 (9th Cir.), *cert. denied*, 347 U.S. 989 (1954) and in *Del Francia v. Stanthony Corp.*, 278 F.2d 745 (9th Cir. 1960).

Other cases decided by the Ninth Circuit apparently follow the holding of *Graver Tank* quite closely. For example, in *Moon v. Cabot Shops, Inc.*, 270 F.2d 539 (9th Cir. 1959), *cert. denied*, 361 U.S. 965 (1960), the court stated:

> It thus becomes necessary for us to analyze and construe the claims of the patent. In doing so, we are mindful of certain well established rules of construction.

Id. at 543. Later it indicated:

> The factual finding of the trial court that the accused devices are not equivalent to the patent claims, as so construed, is not to be disturbed unless clearly erroneous. Graver Tank & Mfg. Co. v. Linde Air Products Co., 339 U.S. 605, 610, 70 S.Ct. 854, 94 L.Ed. 1097. We find no clear error in the making of this finding.

Id. at 545. Thus, even though faced with the necessity of construing the claims, the court nevertheless followed

the holding of *Graver Tank* unlike other decisions of the same court in *Kemart, Kwikset,* and *Del Francia.*

The Ninth Circuit used yet another approach in *No-Joint Concrete Pipe Co. v. Hanson,* 344 F.2d 13 (9th Cir.), *cert. denied,* 382 U.S. 843 (1965). There the court reversed the district court on the issue of infringement, finding error in the district court's application of the doctrine of equivalents. It did not mention the standard of review except to state its conclusion that the district court had erred.

The Tenth Circuit, in at least in one case, appeared to indicate that it rigidly applied the clearly erroneous standard to determinations of infringement and equivalence. *Price v. Lake Sales Supply R. M., Inc.,* 510 F.2d 388 (10th Cir. 1974). In a more recent case, the Tenth Circuit applied certain confused and open-ended exceptions to the clear and unequivocal statement in *Graver Tank* that the determination of equivalence is a finding of fact. In *Burger Train Systems, Inc. v. Ballard,* 552 F.2d 1377, 1382-83 (10th Cir.), *cert. denied,* 434 U.S. 860 (1977), the Tenth Circuit said:

> However, where as here it can be determined that the only feature which renders the design patentable is not on the allegedly infringing device, the question is not a dispute of fact; rather, it becomes a question of law.
>
> *Ziegler v. Phillips Petroleum Co.,* 483 F.2d 858 (5th Cir. 1973), *cert. denied,* 414 U.S. 1079, 94 S.Ct. 597, 38 L.Ed.2d 485 (1974) [sic], is in accord. The decision in that case was that the question of infringement is a factual one, whereby the district court's findings are to be reviewed by use of a

> clearly erroneous standard. The Fifth Circuit said that the district court must first, however, construe the patent and that this is a question of law. Where such construction is necessary, the question of infringement is not a question of fact. *Id.* at 867.

No question of infringement exists wherein the construction of the claim is not necessary. The result of the application of such an "exception" turns every question of infringement into one of law.

These conflicts representing confused and erratically applied "exceptions" to the holding of *Graver Tank* threaten to destroy all certainty in the doctrine of equivalents. Further, the confusing labyrinth of exceptions encourages frivolous appeals in hope that an appellate court will disagree with the trial court's reading of the record and find a way to turn all questions of fact into questions of law. Similarly, the conflict among the circuits encourages time-consuming and expensive venue battles which have long plagued patent litigation. This unfortunate situation justifies grant of certiorari to review the judgment and opinion of the court below.

4. The Decision Below Conflicts With Other Fifth Circuit Cases on Equivalence and the Standard of Review of a Trial Court's Determination as to Infringement and Equivalence

This case directly conflicts with a number of recent cases within the Fifth Circuit. The court in *Studiengesellschaft Kohle v. Eastman Kodak Co.*, 616 F.2d 1315, 1322-24 (5th Cir.), *cert. denied*, No. 80-546 (December 1, 1980) (citations omitted), said:

> The issue of patent infringement is a question of fact, . . . while the ultimate question of patent validity is one of law. . . .
>
> . . . .
>
> When the questions involved are factual ones, our review of District Court's findings must be limited to the "clearly erroneous" standard of Rule 52(a). If the findings of fact are not clearly erroneous, the only issue on appeal is whether the legal conclusion drawn from those facts is correct.
>
> . . . .
>
> In determining whether a patent has been infringed, it is necessary for the court to construe the patent. The construction of a patent is a matter of law, and appellate courts are not bound by the limitations of Rule 52(a) when examining the District Court's construction of the patent.
>
> . . . .
>
> After the court has articulated the scope of the patent by construing it, the court must then explore the infringement issues. In doing so, it may use two analytical techniques, literal infringement and the doctrine of equivalents.

The Fifth Circuit in *Eastman Kodak* recognized a clear dichotomy between constructions of the claims as legal conclusions subject to full review and determinations of infringement as factual findings subject to clear error review. It also recognized that the finding respecting equivalence was part and parcel of the issue of infringement. In affirming the decision below as to noninfringement, the *Eastman Kodak* court repeatedly stated that the trial court heard testimony about the chemistry involved whereas the appellate court did not. *Id.* at 1341.

In so doing, it gave full effect to the findings of fact concerning nonequivalence. Clearly, the court used a different approach from that of this case where it ruled that because claim construction was the first step toward a determination of infringement, the infringement question turned into one of law.

The Fifth Circuit also maintained the dichotomy between limited review of infringement and equivalence and full review of validity in *Laitram Corp. v. Deepsouth Packing Co.*, 443 F.2d 928, 933 (5th Cir. 1971). The court stated:

> Determining whether the Laitram and the Deepsouth machinery were equivalents entails predominantly determinations of fact requiring the balancing of credibility, persuasiveness and weight of evidence; and the trial court's decision here for review was largely based on its findings as to these criteria. Therefore, under the general principles of appellate review which are equally applicable to patent cases, it should not be disturbed unless it is clearly erroneous.

Also, the court noted that the trial court in *Laitram* viewed motion pictures of the subject machinery in operation and personally witnessed actual on-site demonstrations of both the patented and accused infringing machinery. The deference given to the opportunity of the trial court in *Laitram* stands in stark contrast to the treatment of the findings of fact in this case. Here the opportunity of the trial court to ascertain credibility of the witnesses and to view demonstrations of both the accused and prior art machines made little difference to the reviewing court.

Other cases in the Fifth Circuit where the reviewing court felt bound by the clearly erroneous standard for determinations of infringement and equivalence include *Phillips Petroleum Co. v. Sid Richardson Carbon & Gasoline Co.*, 416 F.2d 10 (5th Cir. 1969) and *American Seating Co. v. Southeastern Metals Co.*, 412 F.2d 756 (5th Cir. 1969).

Although the Fifth Circuit has recognized the different standards of appellate review in the cases noted above, its failure to give effect to findings of fact in this case follows the precedent of a number of other Fifth Circuit cases. The most significant of these is *Ziegler v. Phillips Petroleum Co.*, 483 F.2d 858 (5th Cir.), *cert. denied,* 414 U.S. 1079 (1973). In *Ziegler* the court announced that, while normally infringement is a question of fact, it ceases to be so when the district court is required first to construe the patent because construction of the patent is a question of law. The court then concluded that insofar as standard of review was concerned in such cases, the appellate court was not bound by the Rule 52(a) clearly erroneous standard. Two patents were involved, and the district court's construction of the claims and finding of noninfringement were affirmed as not clearly erroneous with respect to the first patent. As to the second patent, however, the court found error in the district court's construction of the patent; then, based on its own construction of the patent, the court proceeded to apply the doctrine of equivalents to find infringement. This approach as to the second patent in *Ziegler* is very similar to the approach in the case involved in this proceeding.

These conflicts within the Fifth Circuit justify the grant of certiorari to review the judgment and opinion of the court below.

5. The Decision Below Raises Significant and Recurring Problems Concerning the Appropriate Standard of Review of Determinations as to Infringement and Equivalence

The Fifth Circuit's opinion in this case reflects vital considerations that are important in virtually every patent infringement suit. Because this Court has not addressed these matters for over thirty years since its decision in *Graver Tank*, compelling reasons indicate that more definitive guidelines on the doctrine of equivalents and the standard of review of such determinations should now be provided by this Court. Except for those rare cases where infringement has been stipulated, all civil actions for infringement of a patent will involve trial court determinations of the issue of infringement itself. Without further clarification of the standard of review of infringement determinations, patent litigants in the district courts will be confused and uncertain as to the scope of review to be afforded such determinations. More particularly, both patent litigants and lower courts urgently need the assistance of this Court in understanding the proper application of the doctrine of equivalents and the appropriate standard of review of such determinations.

The unanswered questions posed by the issues presented in this petition include the following:

> (1) Is a determination of equivalence between a patented invention and an accused infringing device always a question of fact?
>
> (2) To what extent does the status of claim construction as a question of law affect the status of infringement determinations as questions of fact?

(3) When, if ever, is it appropriate to treat infringement as a mixed question of fact and law, and what impact does such treatment have upon the standard of review of determinations as to infringement?

(4) If a court of appeals determines that the trial court erred in its claim construction, under what circumstances may the reviewing court make its own determination as to infringement of such newly construed claims?

(5) If a court of appeals finds error in claim construction, under what circumstances may it affirm a holding of validity without considering the newly construed claims in light of prior art or remanding to the trial court for such consideration?

The issues presented in this petition impact virtually all patent infringement suits. Some of the issues involved have even greater impact on those patent infringement suits involving application of the doctrine of equivalents. Those cases constitute a very large percentage of all infringement suits. "[E]xperience with patent cases demonstrates that seldom may the question of infringement be determined on the literal words of the claim. U.S. Industries, Inc. v. Otis Engineering Corp., 277 F.2d 282 (5th Cir. 1960)." *Ziegler v. Phillips Petroleum Co.*, 483 F.2d 858, 868 (5th Cir.), *cert. denied*, 414 U.S. 1079 (1973).

Thus, the lower courts are in great need of assistance from this Court in resolving the vital issues presented by this petition, and virtually every patent litigant will benefit from the much needed clarity that this Court can provide in resolving these issues.

CONCLUSION

For these reasons, a writ of certiorari should issue to review the judgment and opinion of the U.S. Court of Appeals for the Fifth Circuit.

Respectfully submitted,

RODNEY KENT CALDWELL
2100 Transco Tower
Houston, Texas 77056
(713) 621-9100

Attorney for Petitioner

Of Counsel:

JOHN D. NORRIS
MARY ALLEN DENT
ARNOLD, WHITE & DURKEE
2100 Transco Tower
Houston, Texas 77056
(713) 621-9100

CERTIFICATE OF SERVICE

The undersigned, attorney for Petitioner, Weidman Metal Masters Co., Inc., hereby certifies that the foregoing PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FIFTH CIRCUIT, was served on Respondents this 2d day of January, 1981, by placing a copy of it in the United States mail, first-class, postage prepaid, addressed to Respondents' attorney, Mr. M. H. Gay, 2100 First City National Bank Building, Houston, Texas 77002.

RODNEY K. CALDWELL

APPENDIX A

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

CIVIL ACTION NO. 75-H-394

WEIDMAN METAL MASTERS CO., INC.,
Plaintiff,

v.

GLASS MASTER CORPORATION,
and FRED F. WILLSON,
Defendants and Counterclaim Plaintiffs,

v.

WEIDMAN METAL MASTERS CO., INC.,
and ROGER F. WEIDMAN,
Counterclaim Defendants.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

This declaratory judgment action arises under the patent laws of the United States, Title 35 of the United States Code, and this court has jurisdiction over the subject matter of this action, plaintiff Weidman Metal Masters Co., Inc., and defendants Glass Master Corporation and Fred F. Willson under 28 U.S.C. § 1338(a) and 28 U.S.C. § 2201. Defendants have raised no objection to venue and are properly before this court.

Plaintiff Weidman Metal Masters Co., Inc. (hereinafter referred to as "Weidman Metal") brings this action for a

declaratory judgment that its Fiber Dragon duct board cutting machines do not infringe U. S. Patent 3,605,534 (hereinafter referred to as "the patent in suit" or "the '534 patent") which issued September 20, 1971, based on an application filed May 24, 1967, in the name of William H. Barr, or, in the alternative, that the '534 patent is invalid.

Defendants Glass Master Corporation (hereinafter referred to as "Glass Master") and Fred F. Willson have counterclaimed for damages and injunctive relief, charging infringement of the '534 patent by Weidman Metal and have sought to add Weidman Metal's president, Roger F. Weidman, as a party counterclaim-defendant.

Mr. Weidman, who is not a plaintiff in this action, contests the jurisdiction of this court over his person insofar as it is asserted by defendants Glass Master and Mr. Wilson in their counterclaim for infringement. This court does not have jurisdiction over the person of counterclaim-defendant Roger F. Weidman. There is no evidence that the plaintiff corporation was an artifice or sham. To the contrary, this court finds that the corporation was formed for legitimate business purposes and was operated as a corporation rather than as an extension of Mr. Weidman.

Mr. Weidman is a resident of Kansas and was not a plaintiff in this action. Defendants have failed to meet their burden of establishing by a preponderance of the evidence that the activities of the corporate plaintiff "in reality were those of [Mr. Weidman] personally," and the corporate plaintiff was not Mr. Weidman's agent or alter ego. *Coryell v. Phillips,* 128 F.2d 702, 704 (5th Cir. 1942). *See Moline Properties, Inc. v. Commissioner,* 319

U.S. 436, 63 S.Ct. 1132 (1943) (mere existence of a corporation with one or several stockholders does not make the corporation the agent of its stockholders); *Cannon Manufacturing Co. v. Cudahy Packing Co.*, 267 U.S. 333, 45 S.Ct. 250 (1925) (corporate separation may not be ignored in determining jurisdiction); *Bass v. Shutan*, 259 F.2d 561 (9th Cir. 1958) (mere fact that all corporate stock is held by one person who exercises sole control over the corporation is insufficient to justify disregarding the corporate entity).

Weidman Metal is a Kansas corporation having its principal place of business in Wichita, Kansas. Glass Master is a Texas corporation having its principal place of business in San Antonio, Texas, and is doing business within the judicial district of this court. Mr. Willson is an individual residing in San Antonio, Texas. Mr. Weidman is an individual residing in Wichita, Kansas. Mr. Weidman is the president, secretary, treasurer, and sole director of the corporate plaintiff, Weidman Metal Masters Co., Inc., and owns 87 percent of the stock of that corporation. Mr. Willson is the owner of all right, title, and interest in and to the patent in suit.

Glass Master and Mr. Willson notified Weidman Metal of the patent in suit by a letter dated January 31, 1974, and on January 30, 1975, brought an action against one of Weidman Metal's distributors, charging that the sale of Weidman Metal's machines constituted infringement of the '534 patent. There exists an actual and substantial controversy between the parties, justifying a declaratory determination of their respective rights.

The patent in suit involves machines for cutting a material called "duct board." Duct board is a fibrous insula-

tion board made of matted fiberglass held together by a suitable binder and having a vapor barrier such as aluminum foil on one side. Duct board is made in flat sheets which are cut to size and "grooved" for formation into rectangular duct for use in heating and air-conditioning systems.

The grooving of the duct board is accomplished by cutting strips of insulation from the fiberglass side of the board without damaging the foil vapor barrier. The strips of insulation are removed so that the board can be folded into the desired rectangular shape and the edges sealed to form the desired duct section. These duct sections are then joined together to make up the heating or air-conditioning duct system. Although the ducts are usually rectangular in shape, circular ducts also may be formed by proper selection of the grooves cut in the duct board.

At the trial on the merits of this action held before the court on February 13, 1978, through February 21, 1978, the parties presented extensive exhibits and testimony relating to the '534 patent and the machines in issue. Relevant portions of that patent are set out below.

Claim 1 of the '534 patent reads as follows:

> 1. A cutting machine comprising,
> a support,
> a cutter on said support,
> means for feeding a board of fibrous material having a facing on at least one side thereof across the cutter from the front to the rear of the machine,
> said cutter having knife blade means which is formed to produce the desired cut in a board and includes a section extending parallel to the plane of movement of the board across the machine,

and blade support means effective on said parallel extending section of said blade means to support said section while permitting the facing on a board being cut to pass between the blade support means and said section of the blade means,
said blade support means underlying said section of said blade means,
one of said knife blade means and said blade support means including resilient means preventing said blade support means from exerting excessive force on said section of said knife blade means.

Claims 2-5 add further definitions and limitations to claim 1.

Claim 6 of the '534 patent reads as follows:

6. A cutting machine comprising,
a support,
a cutter on said support,
means for feeding a board of fibrous material having a facing on at least one side thereof across the cutter from the front to the rear of the machine.
said cutter having knife blade means which is formed to produce the desired cut in a board and includes a section extending parallel to the plane of movement of the board across the machine,
said knife blade means having a cutting edge extending rearwardly of the machine along its entire length from a point at which the cut in a board is commenced,
a support roller underlying and supporting said section of said knife blade means at an area rearwardly of the foremost point of the cutting edge on said section while permitting the facing on a board being cut to pass between the roller and said section of the knife means,
said knife blade means including resilient means preventing said roller from exerting expressive pressure on said section of said knife blade means.

Claims 7 and 8 depend from and add further limitations to claim 6.

Claim 9 of the '534 patent reads as follows:

> 9. A cutting machine comprising;
> a support,
> a plurality of cutters on said support,
> a pair of front feed rollers and a pair of rear feed rollers on opposite sides of said support for feeding a board of fibrous material having a facing on at least one side thereof across the cutters,
> each cutter including a knife blade mounted on a carrier,
> said knife blade having a first section extending parallel to the plane of movement of the board across the machine for cutting fibrous material from the facing and a second section between the carrier and first section which is not perpendicular to the first section to give resiliency to the knife blade,
> a guide roller between the front feed rollers and the plurality of cutters for guiding the board to said knife blades,
> a support roller underlying and supporting said first blade section while permitting the facing on a board being cut to pass between said support roller and said second blade section,
> the surface of said roller supporting said second blade section lying in an area just rearwardly of the forwardmost portion of said first blade section.

Claims 10-13 depend from and add further limitations to claim 9. Claims 14-16 relate to the particular configuration of the cutter. Defendants have stipulated that Weidman's Fiber Dragon duct board cutting machines do not infringe claims 5 and 12-16 of the patent in suit.

The patent in suit discloses a duct board cutting machine in which three types of cutting operations are performed: (1) cuts completely through the fiberglass insulation material and the foil vapor barrier; (2) cuts removing some of the insulation material but not "skimming" the insulation from the foil vapor barrier; and (3) cuts in which a portion of the insulation material is removed from the foil vapor barrier without injury to the foil. It is to this third type of cutting operation that the claims of the patent in suit are directed.

The patent specification describes the patented device as including a support 32 (references are to the patent drawings) on which a plurality of cutters 33 are mounted. The cutters 33 include skid or "sleigh-like" members 51 to which are held suitable knife blades 52. To relate the knife blade 52 to the board 14 as the board passes through the machine, to be certain that the knife is correctly positioned, a "blade support means" which "cooperates with the blade" is provided. U. S. Patent 3,605,534, Col. 3, line 42—Col. 4, line 53. See Appendix A, sheet 2.

The only form of blade support means disclosed in the specification and drawings of the '534 patent is the roller 59, which is variously called "the blade support" and "the support roller." The function of this blade support means or roller is "to position and hold the blade in the desired relationship to the board." U.S. Patent 3,605,534, Col. 4, lines 48-63.

The knife blade 52 is specially designed "to cooperate with the blade support [roller] 59," and has a section "52a which extends horizontally or parallel to the plane of movement of the board across the machine. . . . [T]he

section of the blade 52a lies in a plane tangent to the roller 59 and provides a *bearing area* [hereinafter referred to as the "bearing" portion of the blade]." U.S. Patent 3,605,534, Col. 4, lines 64-69 (emphasis added).

Either the support roller 59 or the knife blade is provided with "resilient means" to compensate for differences in the bending of the blade mounting structure (support 32) and the blade support (roller 59), as well as manufacturing tolerances in the components of the machine. This "resilient means" is to prevent the blade support (roller 59) from "exerting excessive force on the section 52a of the knife blade." U.S. Patent 3,605,534, Col. 4, line 70 - Col. 5, line 4.

This "resilient means" preferably is provided by section 52b of the knife blade, which extends horizontally between section 52a and the cutter support 32. The patent specification discloses, however, that if the blade includes any portion that is not normal (perpendicular) to the section 52a, it will "permit the knife to bend and act in the manner of a spring so that excessive pressure cannot be applied to the knife through the support roller 59. With the spring action defined above, the lowermost portion of the knife blade, which will remove the fibrous material adjacent the facing, is correctly positioned for this task, and yet is free to give sufficiently to permit the facing material to pass between the knife blade and the support means." U.S. Patent 3,605,534, Col. 5, lines 5-23.

The patent specification further states that the "*positioning* of the support [roller] 59 in the fore and aft direction of the machine relative to the section of the knife blade 52a which it supports [the bearing section]

is important [emphasis added]." If the support roller is positioned too far forward, it will interfere with the facing material moving under the knife blade. If too far to the rear, the knife blade may rise up and leave an excessive amount of fiberglass on the facing. The patent then teaches that "the support means at the point where it *engages* the knife blade section 52a, with no board 14 in place, should be about 1/8" to 1/4" rearwardly of the frontmost cutting edge of the section 52a [the bearing section] of the knife blade [emphasis added]." Thus, the specification states that if the roller is positioned too far to the rear, the device will still operate but not as effectively. However, there is absolutely no suggestion that the reverse, *i.e.* positioning the roller well forward of the knife blade, will result in effective operation of the machine. To the contrary, the specification teaches that the machine will not function properly with the roller so positioned. U.S. Patent 3,605,534, Col. 5, lines 38-63.

In the accused Fiber Dragon machines, the cutters are mounted between a pair of tool bars. The knife blades which function to remove or "skim" the fibrous insulation material from the foil vapor barrier are located behind the nearest roller and below the plane of the board as it moves through the machine. See Appendix B.

In considering infringement, resort must first be had to the claims of the patent and, if the accused device comes within the literal language of the claims, infringement usually is made out. *Graver Tank & Manufacturing Co. v. Linde Air Products Co.*, 339 U.S. 605, 70 S.Ct. 854 (1950).

There is no literal infringement of the claims at issue in the present action. Considering claims 1-4, the accused device does not have:

> blade support means effective on [the bearing] section of said blade means to support said section while permitting the facing on the board being cut to pass between the blade support means and said section of the blade means,

nor does the accused device have:

> blade support means underlying said section of said blade means,

nor does the accused device have:

> resilient means preventing said blade support means from exerting excessive force on said section of said knife blade means.

Considering claims 6-8, the accused device does not have:

> a support roller underlying and supporting [the bearing] section of said knife blade means at an area rearwardly of the foremost point of the cutting edge on said section while permitting the facing on a board being cut to pass between the roller and said section of the knife blade means,

nor does it have:

> said knife blade means including resilient means preventing said roller from exerting excessive pressure on said section of said knife blade means.

Considering claims 9-11, the accused device does not have:

> [a] knife blade having a first section extending parallel to the plane of movement of the board

> across the machine for cutting fibrous material from the facing and a second section between the carrier and the first section which is not perpendicular to the first section to give resiliency to the knife blade,

nor does it have:

> a support roller underlying and supporting said first blade section while permitting the facing on a board being cut to pass between said support roller and said second blade section,

nor does it have:

> the surface of said roller supporting said second blade section lying in an area just rearwardly of the forwardmost portion of said first blade section.

There is no infringement of the claims of the patent in suit under the doctrine of equivalents because the accused device includes no elements which are the equivalent of the "blade support means," "support roller," or "resilient means" as those terms are used in the specification and claims of the patent in suit.

The patentee of the patent in suit acknowledged in the specification that certain of the knife blades disclosed, those intended for making cuts which do not result in removing substantially all of the fibrous material from the facing, do not have a portion or section corresponding to the "bearing" section described above. Of these knife blades, the patentee said "[a]s they are not cutting close to the facing material their positioning is not too critical." U.S. Patent 3,605,534, Col. 6, lines 46-53. It is clear that the patentee regarded the relative positioning of the knife blades and the support roller with respect to one another as critical when the cut was to be made close to the facing, and the specification cannot be dis-

regarded in determining what is equivalent to each of the elements required by the patent claims.

To the extent that patentability of the claims in suit is based on the positioning of a roller beneath the knife blades, that concept was disclosed to Mr. Barr by Mr. Roberts during the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) show in Louisville, Kentucky, in early 1966. At that time, Mr. Barr had built and was exhibiting a duct board cutting machine having a pair of front feed rollers and a pair of rear feed rollers on opposite sides of a support on which a plurality of cutters were located. Directly below the cutters was located a nonmoving table for supporting the duct board as the board was moved across the cutters by the feed rollers. This arrangement proved unsatisfactory in operation, and Mr. Roberts suggested to Mr. Barr that the substitution of a roller for the existing table would remedy the problem. Mr. Barr thereafter constructed a cutting machine incorporating that concept and filed the application which led to the patent in suit.

The mode of operation and the structure of the accused Fiber Dragon machines differ significantly from the Barr device, and the accused machines function in a different manner from that disclosed and claimed in the '534 patent.

Infringement requires substantial identity of structure, mode of operation, and results accomplished. *See, e.g., Ziegler v. Phillips Petroleum Co.,* 483 F.2d 858, 868 (5th Cir.), *cert. denied,* 414 U.S. 1079 (1973); *Harrington Manufacturing Co. v. White,* 475 F.2d 788, 796

(5th Cir. 1973); *Foster Cathead Co. v. Hasha*, 382 F.2d 761 (5th Cir. 1967), *cert. denied*, 390 U.S. 906 (1968).

The scope of every patent is limited to the invention described in its claims, read in the light of the specification and drawings. *Motion Picture Patents Co. v. Universal Film Manufacturing Co.*, 243 U.S. 502, 37 S.Ct. 416 (1917); *Ziegler v. Phillips Petroleum Co.*, 483 F.2d 858, 868 (5th Cir. 1973); *Marvin Glass & Associates v. Sears Roebuck & Co.*, 448 F.2d 60, 62 (5th Cir. 1971). The claims of a patent "cannot be given a construction broader than the teachings of the patent as shown by the drawings and specifications." *U.S. Industries, Inc. v. Otis Engineering Corp.*, 254 F.2d 198, 201 (5th Cir. 1958). *See Ziegler, supra* at 869.

It is well established that in order to find infringement of a combination claim, such as here, the accused structure must include all of the elements of the claim. Omission of a single element avoids infringement. *Stewart-Warner Corp. v. Lone Star Gas Co.*, 195 F.2d 645, 649 (5th Cir. 1952); *see Marvin Glass, supra* at 61.

One claiming under a patent is bound by the restrictive or limiting language used by the patentee in describing an element of the patented combination. *Baldwin-Lima-Hamilton Corp. v. Hi-Way Equipment Co.*, 250 F. Supp. 574, 581 (S.D. Tex. 1965).

It is a "universal principle of patent law that in a combination every element is essential, and the patentee may not after issuance assert that that which was described as essential was immaterial after all. [citations omitted] If an element is completely missing as it is here and the function of that element is not afforded by

that which remains, then there can be no infringement no matter how immaterial from a practical operational sense the missing component may have been." *Reed v. Parrack,* 276 F.2d 784, 788 (5th Cir. 1960).

The burden of proof in a declaratory judgment action involving patent infringement is on the defendant owner of the patent at issue, who has charged plaintiff with infringement. He has the burden of proving validity and infringement just as if he were the plaintiff suing for infringement of the patent. 6A MOORE'S FEDERAL PRACTICE § 57.31[2], at 57-266 (1973); *Purer & Co. v. Aktiebolaget Addo,* 410 F.2d 871 (9th Cir. 1969); *Deere & Co. v. Sperry Rand Corp.,* 322 F. Supp. 397, 398 (E.D. Cal. 1970). *See also Ceco Corp. v. Bliss & Laughlin Industries, Inc.,* 186 U.S.P.Q. 114, 129 (C.D. Cal. 1975); *Ballantyne Instruments & Electronics, Inc. v. Wagner,* 260 F. Supp. 540, 545 (S.D. Ohio 1966); *Philip A. Hunt Co. v. Mallinckrodt Chemical Works,* 72 F. Supp. 865, 873-74 (E.D.N.Y. 1947); and, in particular, *see* BORCHARD, DECLARATORY JUDGMENTS (1941), which states at 404 (emphasis added):

> Burden of Proof
>
> Since as a rule the risk of non-persuasion is on the plaintiff, it is not surprising to find that the burden of proof in declaratory actions rest, in the vast majority of cases, on the moving party. Yet, as we shall see, the peculiar nature of the suit for a declaration of non-liability may shift that burden to the defendant, the party who originally made the charge or claim, *such as patent infringement,* which is the basis of the action for a declaration of non-liability.

Weidman's Fiber Dragon duct board cutting machines do not infringe any claim of the patent in suit because the accused structures do not include either "blade support means," a "support roller," or "resilient means" as those terms are used in those claims, whether read literally or by virtue of the doctrine of equivalents.

In conclusion, the court finds that the Fiber Dragon machines manufactured and sold by Weidman Metal Masters Co., Inc., do not infringe U.S. Patent 3,605,534 owned by Mr. Fred Willson and that defendants' counterclaim for damages and injunctive relief should be dismissed. The court further finds that said patent is a valid patent. The court does not find that this is an exceptional case under 35 U.S.C. § 285 and therefore does not find an award of attorneys fees proper in this case. Accordingly, each party will bear the burden of their costs and attorneys fees in this suit.

The foregoing constitutes this court's findings of fact and conclusions of law. To the extent any findings of fact made herein constitute conclusions of law, the same are adopted as such; to the extent any conclusions of law also constitute findings of fact, the same are also adopted as such.

DONE at Houston, Texas, on the 28th day of April, 1978.

/s/ JOHN V. SINGLETON, JR.
United States District Judge

APPENDIX B

WEIDMAN METAL MASTERS CO., INC.,
Plaintiff,

v.

GLASS MASTER CORPORATION and Fred F. Willson,
Defendants-Counterclaim Plaintiffs-Appellants,

v.

WEIDMAN METAL MASTERS CO., INC.,
and Roger F. Weidman,
Counterclaim Defendants-Appellees.

No. 78-2372

UNITED STATES COURT OF APPEALS
Fifth Circuit

Aug. 13, 1980.

Rehearing and Rehearing En Banc
Denied Oct. 3, 1980.

Patent holder appealed from judgment entered by the United States District Court for the Southern District of Texas, John V. Singleton, Jr., Chief Judge, in action concerning alleged patent infringement. The Court of Appeals, Alvin B. Rubin, Circuit Judge, held that under doctrine of equivalents, patent no. 3,605,534 covering device used to cut grooves in duct board so that it can most practicably be used to form ducts for central air-conditioning and heating systems was infringed upon by competing machine, even though trial court concluded

there was no literal infringement. The patent was not invalid on the basis that it represented no advancement over prior art.

Reversed in part, affirmed in part, and case remanded.

M. H. Gay, Houston, Tex., for defendants-counterclaim plaintiffs-appellants.

Rodney K. Caldwell, Houston, Tex., for counterclaim defendants-appellees.

Appeal from the United States District Court for the Southern District of Texas.

Before DYER, RUBIN and POLITZ, Circuit Judges.

ALVIN B. RUBIN, Circuit Judge:

The holder of a patent for a device used to cut grooves in duct board so that it can most practically be used to form ducts for central air conditioning and heating systems appeals the determination by the trial court that the patent was not infringed by a competing machine. The issues require only the application of long settled principles. Differing with the trial judge, we conclude that the plaintiff's device was equivalent in function and operation to the patented machine and that it, therefore, infringed the defendant's patent.

I.

[1, 2] The principles that guide us have been frequently stated and restated. We sum them up without lengthy citation. The validity of a patent and its interpretation are both questions of law. Each may depend upon

factual inquiries. After the proper construction of a patent is determined, whether the patent, thus interpreted, has been infringed is a question of fact.

[3-5] A patent is obviously infringed if the accused device incorporates its teaching literally read. In reading a patent to determine whether it has thus been infringed, its claims must be read in connection with its specifications and its file history; the patent's claims cannot be construed to reach beyond the teachings expressed in the patent. Minor modifications are, therefore, sufficient to avoid literal infringement. Such alterations may, however, result in a device that appropriates the invention and incorporates its innovative concept into a device that performs substantially the same function in substantially the same way to obtain substantially the same result. The "doctrine of equivalents" protects the patent and its inventor from such abuse.

[6] The ultimate question, as the title of the rubric implies, is whether the accused device is functionally equivalent to the patented one. What constitutes equivalency is determined in the context of the scope of the prior art, the nature of the patent, the real invention disclosed by its specifications and examples and the extent of innovation accomplished. A pioneer patent disclosing a function never before accomplished is entitled to broader protection than one that makes minor improvements on known technology. The range of equivalents is also limited by the patentee's surrender or amendment of claims in response to demands of the patent examiner, a process that creates "file wrapper estoppel."

In applying these rules, if the question involved is a legal one, we are free on appeal to reexamine the answer

given by the trial court. If it is, however, factual, then we defer to the trial court's findings and may reverse them only if they are clearly erroneous. Fed.R.Civ.P. 52(a). *See Kaspar Wire Works, Inc. v. Leco Engineering & Machine, Inc.*, 575 F.2d 530, 533 n.1 (5th Cir. 1978). These precepts are taught by a host of cases, a number of which are cited in our own recent opinion in *Studiengesellschaft Kohle mbH v. Eastman Kodak Co.*, 616 F.2d 1315 (5th Cir. 1980).

II.

Central air-conditioning and heating systems require ducts to carry the heated or cooled air from the central unit to various areas. Ducts should be insulated for energy efficiency. One commonly used insulation is factory-made in a form called "duct board;" this is a sheet of matted fiberglass held together by a binder to form a board with a vapor barrier such as aluminum foil on one side. Duct board is usually shipped by the manufacturer in large flat sheets. On the job, the sheets are cut and formed into the sizes and the three-dimensional shapes required.

The thick board cannot readily be bent into shape; the method used to fabricate the desired ducts is to cut grooves into the board, removing the insulating material but leaving the vapor barrier intact, then to fold the board into the desired shape. The edges brought into contact are then resealed. The duct sections thus formed are joined to make up the air carrying system. The typical duct is rectangular, but the same method can be used to produce other shapes.

Two decades ago grooves were cut in duct board by the hand use of cutting tools. As the use of duct board

increased, machines were developed to reduce the hand labor. By 1965 two machines were available; in each the duct board was held in a fixed place and cutting tools, mounted on a tool bar, were drawn across the board to cut the grooves. Another tool, made by the Howard C. Forrest Co. and known as the Forrest machine, used cutters fixed in place. The duct board was fed horizontally across the cutters by a pair of feed rollers—a set of conveyor rollers that looked much like rubber tires—mounted on a rotary shaft. The cutters were mounted on a support. A roller located on the opposite side of the board from the cutters held the board against the cutting blades as the board was moved across the cutters. The knife blades were located so that they made the deepest cut in the board just behind the top of that roller. The cutting blade used was triangular, but there was testimony that the machine could be adapted to use knives that would cut shiplap grooves.

It is easier to form duct board into the desired shape when the grooves are cut shiplap rather than triangular. Shiplap grooves also permit square corners to be formed, which is difficult to accomplish with triangular grooves. The patent (U.S. Patent 3,605,534, referred to as the '534 patent or the Glass Master patent) is for a machine to cut several shiplap grooves in duct board while it is passing through the machine so that it can be fabricated into duct sections. The invention covered by the '534 patent provided for the first time a machine that in a single pass would cut a modified shiplap groove without piercing the foil, so that only a single stapling and taping of a flap was necessary when folding a grooved board into rectangular shape to form a duct. To make this duct

by hand required 12 minutes. It could be made in a fraction of that time on the machine.

Application for the '534 patent was filed in May, 1967. The '534 patent is owned by defendant Willson, and Glass Master Products is Willson's exclusive licensee. Another duct board cutting machine, called the Fiber Dragon, is made by the plaintiff, Weidman Metal Masters Company.

The '534 patent teaches a machine having cutters mounted on a tool bar support, with feed rollers mounted on opposite sides of the support for feeding a sheet of duct board across the cutters. Each of the cutters includes at least one knife blade formed to produce the desired deep cut in the board close to the foil. Each knife blade includes a flat bottom section for cutting directly over a blade support roller. The knife blade is shown as having a second section situated above this cutter and below the knife blade carrier, designed to make the blade resilient. This prevents the blade support roller from exerting excessive force on the lowermost flat section of the knife blade.

The heart of the '534 invention lies in the relationship of three elements: the tool bar or support (which is rigid on Glass Master), the knife blade and the support roller. The '534 patent teaches that the position of the knife blade against the duct board is controlled by the support roller, and that two of these elements should be rigid and the third relatively resilient so that the knife blade, guided by the support roller, will rise and fall as the roller rotates in order to maintain its proper cutting position. When these three elements are used in the functional relationship conceived by the inventor, the machine re-

moves all of the insulation material without piercing the vapor barrier and leaves a shiplap groove that facilitates easy assembly of a duct.

The patent teaches that the preferred form of the device employs a rigid tool bar and a rigid support roller with a resilient knife blade. While passing through the machine the duct board is slightly compressed between the blade and the support roller so that the foil vapor barrier first touches the support roller in front of the leading edge of the knife blade and remains in contact with the roller as the foil slides under the blade. When the knife blade is positioned behind the top dead center of the roller, as in the Weidman machine, the same effect is achieved. The duct board expands as it passes over the top of the roller and presses against the downward arc of the roller. The foil remains in contact with the roller and the expansion pressure continues to hold the foil in position against the roller so that the blade strips the insulation material without piercing the foil. If the support roller rotates imperfectly in the Glass Master machine, the resiliency in the knife blade prevents the imperfection from causing the roller and blade to contact with one another and cause the blade to tear the foil vapor barrier. The '534 patent suggests, as even the Fiber Dragon proponents admit, that the resilient means necessary for operation of the contemplated device might be provided by providing resilience in another of the three elements, the support roller, but it makes no express claim for resilience in either the support roller or the tool bar.[1]

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1. The suggestion is not accidental. During examination of the 534 application, the Examiner asked that Claims 1 through 3 and 6 be amended and suggested an amendment as follows:

"said knife blade means including a resilient section allowing

Weidman began production of its Fiber Dragon in 1973. In the Fiber Dragon machine the knife blades do not cut directly on a roller. The knives are mounted so that they make their deepest cuts behind a guide roller and in a plane below the plane defined by the tops of the lower feed and guide rollers. The Fiber Dragon machines do not have resilient knife blades.

Before building their first Weidman machine, Weidman's employees had examined a Glass Master machine, and the Fiber Dragon machine is in many aspects a copy of Glass Master. It uses the same three basic elements, the tool bar, the cutting knife blade and the support roller (a guide roller in the Fiber Dragon). Two of these elements are designed to be rigid and one is in fact resilient, the tool bar. Whether the resiliency is purposefully provided is not clear; it is evident that, given relative rigidity in the other members, the Fiber Dragon would tear the vapor barrier unless resiliency was supplied by the tool bar.

In operation of the Fiber Dragon, the duct board does not merely roll tangentially to the guide roller but, as a

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said parallel section to move away from said blade support means to prevent excessive force on said parallel section."

In the responsive amendment the applicant said:

"It is submitted that Applicant is not restricted to claiming the exact means shown in the drawings. The suggested wording of the Examiner is appreciated, but it is feared that such wording would limit the invention to using the exact knife blade means shown. As the resilient means could be applied between the actual cutting edge and the carrier, as explained above, or the resilient means could be provided in the mounting of the support means, it is believed that Applicant is entitled to claim the structure broadly. The Examiner will appreciate that the only question here is one of controlling the pressure between the blade and support."

In response to this argument, the Examiner allowed the claims in their form as originally submitted.

result of compression, remains in contact with the top two inches of the roller. The compression not only forces the duct board downward against the roller but upward against the knife blade. If nothing yielded, then the knife blade could cut the foil. Instead the upward force lifts the blade slightly more than 3/32 of an inch. This is accomplished by bending the tool bar, which is two inches square but ten feet long. Thus the indispensable resilience is provided by the flexibility of the tool bar.[2]

A second basic difference between the Fiber Dragon and the '534 patent is in the position of the knife blade in relationship to the guide roller. On Glass Master the knife is immediately over the top of the roller, a position taught by the patent which causes the roller to support the knife blades; the knife on the Fiber Dragon is positioned behind the apogee of the roller. The expert who testified on behalf of Weidman found in this the only substantial difference between the two machines. If, however, the knife on the Fiber Dragon were positioned over the roller top, it would cut better. Moving the knife back slightly makes the cut less consistent and results in leaving more fiber in the cut.

The trial judge's oral remarks, which indicate his understanding ever more clearly than the written findings he signed upon submission, limited the patent to a device with a resilient blade positioned directly over the roller. He concluded that the claims of the patent, which call for a roller acting as a support for knife blades, could not be read to include a machine in which the roller was not acting as a blade support. This denied the patent any

2. The Fiber Dragon instruction manual says that, after the tool bar is satisfactorily adjusted, the insulation board will spring down under the knives to remove any worry about cutting into the foil.

range of equivalents. He then found the Fiber Dragon different from the invention claimed by Patent '534 in the two ways discussed: the position of the blade in relationship to the roller and the reliance on either the knife blade or the rollers to provide resiliency during cutting.

III.

Claim 1 is set forth in the margin.[3] At least one of its descriptions is not literally infringed. The last paragraph of claim 1 teaches that one of the knife blades and one of the blade supports includes resilient means to avoid excessive force on the knife blade (which would result in piercing the vapor barrier). The Fiber Dragon includes no resilient means in either member. We find it unnecessary similarly to analyze each of the remaining ten claims. In his written findings of fact, prepared by counsel for Weidman, the trial judge did so and concluded there was

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3. 1. A cutting machine comprising,
a support,
a cutter on said support,
means for feeding a board of fibrous material having a facing on at least one side thereof across the cutter from the front to the rear of the machine,
said cutter having knife blade means which is formed to produce the desired cut in a board and includes a section extending parallel to the plane of movement of the board across the machine,
and blade support means effective on said parallel extending section of said blade means to support said section while permitting the facing on a board being cut to pass between the blade support means and said section of the blade means,
said blade support means underlying said section of said blade means,
one of said knife blade means and said blade support means including resilient means preventing said blade support means from exerting excessive force on said section of said knife blade means.

no literal infringement. Although we do not necessarily subscribe to his entire interpretation of each claim, and we are mindful that the interpretation of the patent is a question of law, we find his reading of salient portions of each claim legally correct, and we do not find erroneous the factual conclusion that the claim, thus read, is not literally infringed.

[7-10] Inventions, however, are not limited to the preferred embodiment disclosed in a patent. Patent construction is not a matter of pure literalism and slavish adherence to the words used. *Merry Manufacturing Co. v. Burns Tool Co.*, 335 F.2d 239, 244 (5th Cir. 1964). A patent is to be construed as a contract with the intent of the parties as the lodestar. It is the real invention claimed and granted protection which we seek to determine. *Del Francia v. Stanthony Corp.*, 278 F.2d 745 (9th Cir. 1960). *See Laitram Corp. v. Deepsouth Packing Co.*, 443 F.2d 928 (5th Cir. 1971).

In Fiber Dragon the knife is rigid but the cutter is carried on a resilient tool bar. The machine in operation relies upon a long slender tool bar to provide the necessary resiliency. Claim 1 reads in terms directly upon the structure of the Fiber Dragon except that the '534 patent calls for the knife blade means or the blade support to be resilient. The Fiber Dragon merely transposes parts that perform the identical function. Such transposition does not avoid infringement.

The alteration of the knife's relationship to the roller is but a slight repositioning of an element of a combination and the consequent acceptance of a slightly less efficient job. This does not avoid infringement. The positioning of the knife behind, rather than above, the

guide roller does not alter the fact that, in both machines, the roller exerts force through the duct board against the knife blade, thus positioning the blade for the optimum cut. Without resiliency, this would cause the knife to tear the vapor barrier, particularly when the blades dulled and had to be moved closer to the roller to achieve the desired cut. The patent teaches both the effect of the roller on the knife and the need for resiliency to utilize that effect. Moreover, in both machines the compression of the duct board between a roller and the knife blade causes the foil vapor barrier to remain in contact with the roller as it passes by the forwardmost cutting edge of the knife. The operation and the results achieved by the Fiber Dragon are essentially the same as those of the device disclosed by '534 save for inferior performance.

It is not necessary for us here to determine how near to the forefront of pioneers patent '534 comes. Although it did achieve a result never before accomplished, even the minimum equivalency due to any patent normally forbids the mere reversal of a function of two parts and the small movement of one part to avoid literal infringement by accepting a less efficient job.

[11, 12] Decision of an infringement claim requires a court to look at the heart of the invention. If it is appropriated, the patent is infringed. *Harrington Manufacturing Co. v. White,* 475 F.2d 788 (5th Cir.), *cert. denied,* 414 U.S. 1040, 94 S.Ct. 542, 38 L.Ed.2d 331 (1973). Normally infringement is a question of fact. *Ziegler v. Phillips Petroleum Co.,* 483 F.2d 858, 867 (5th Cir.), *cert. denied,* 414 U.S. 1079, 94 S.Ct. 597, 38 L.Ed.2d 485 (1973). However, in this case, the critical analysis provided by the district judge involved

the construction of the patent. When this is so, legal questions are intertwined with the factual issues and we are not strictly limited by the clearly erroneous standard in our review. *Id.* As we construe the patent, its crucial teaching was the relationship between the support roller and the knife blade achieved when the roller transfers force through the duct board to a knife resilient enough to react to that force. Neither the position of the knife in relation to the roller nor the source of the resiliency is crucial, although both are important, as evidenced by the inferior performance of the Weidman machine. However, in regarding these factors as limitations on the patent and finding no infringement for that reason, the district judge erred.

IV.

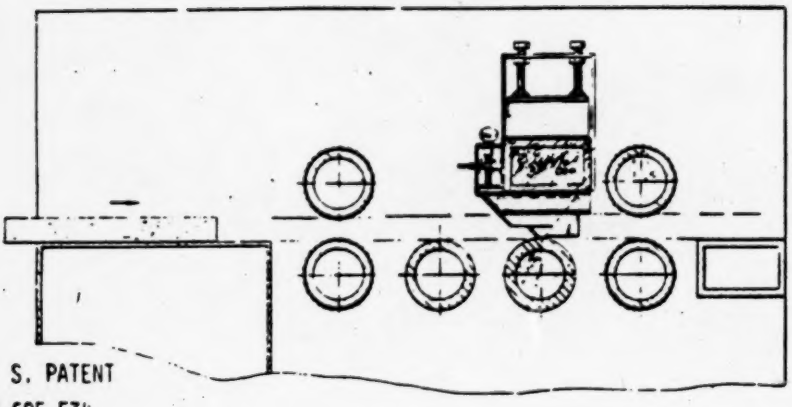
The trial judge found the patent valid. Weidman argues alternatively that its device can be found to infringe '534 only as the result of reading that patent so broadly as to make it invalid when compared with prior art, embodied in a machine called the Forrest machine. The Forrest machine as it was used before the date of filing the '534 application, was not capable of making a modified shiplap cut. It utilized V-blades and left a space between the duct board and the cutters. The sole function of the roller in the Forrest machine was to hold down and guide the board across the blade. When, during the course of the trial, an experiment was conducted outside the court room by putting shiplap tools on Forrest, the foil was torn and there were problems in getting the knives to work. There was apparently no resiliency in the Forrest blade apparatus, and the guide

roller did not operate to position the blade relative to the duct board vapor barrier. The '534 patent was, therefore, neither anticipated nor made obvious by Forrest.

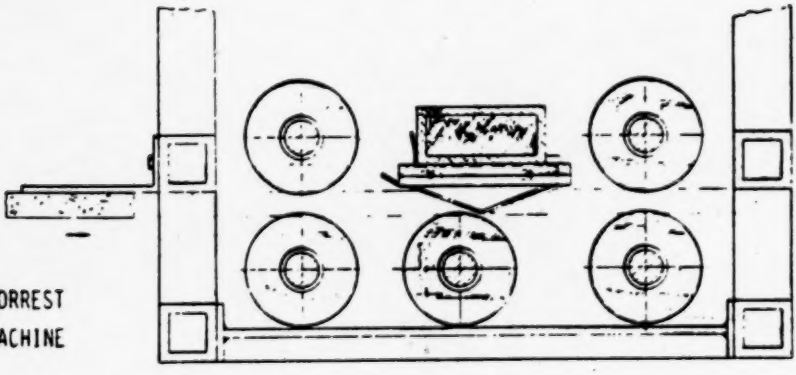
For these reasons, the judgment of the district court that the Fiber Dragon does not infringe the '534 patent is REVERSED, the determination that the patent is valid is AFFIRMED, and the case is REMANDED for further proceedings, consistent with this opinion.

Appendix to follow.

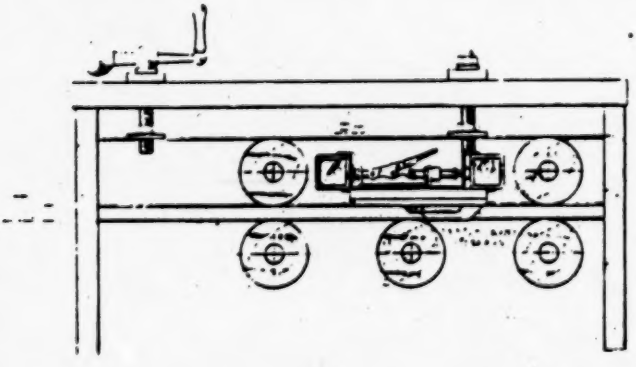
APPENDIX



U. S. PATENT
3,605,534



FORREST
MACHINE



WEIDMAN
MACHINE

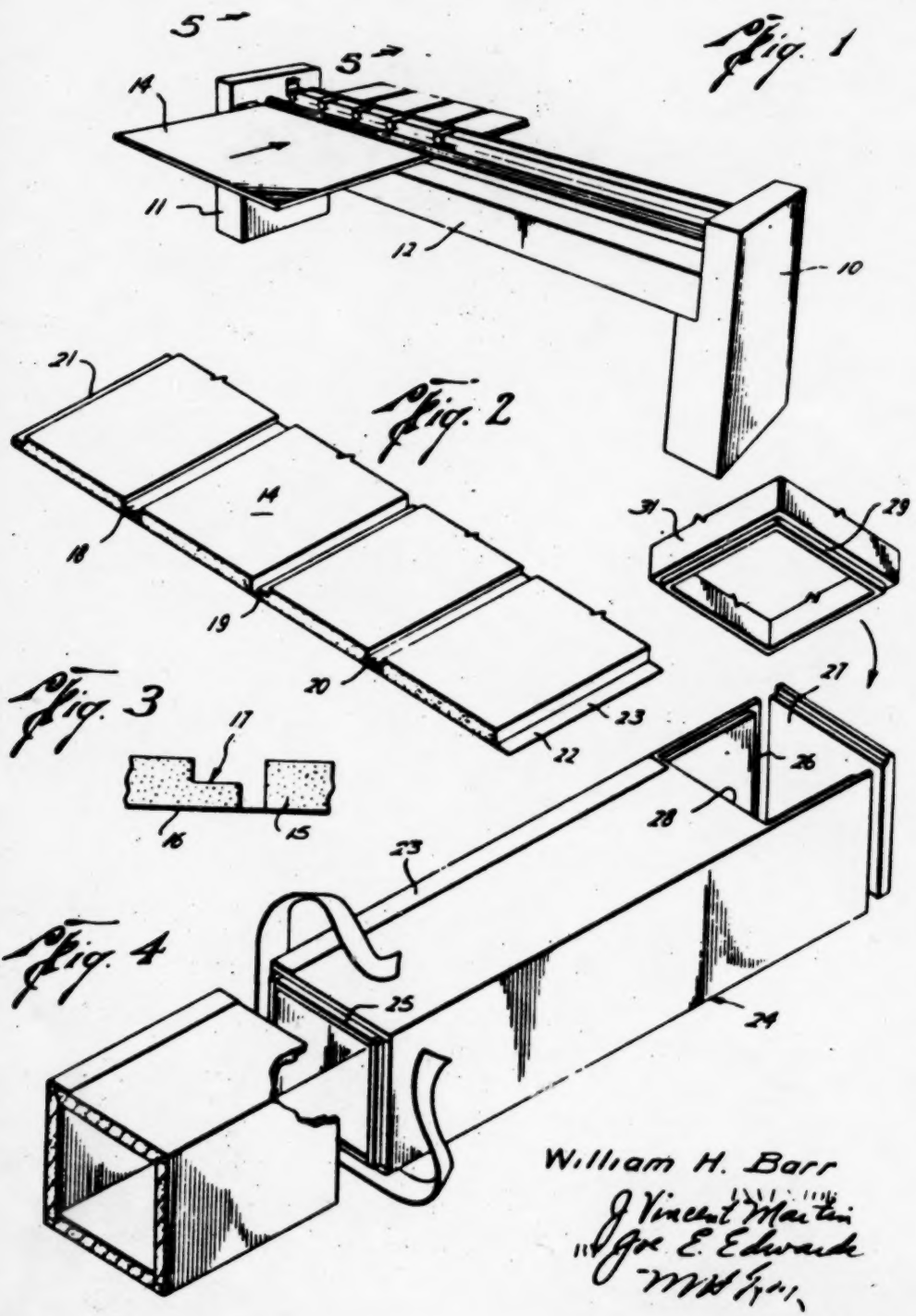
NOTE: In the Forrest machine the cutting blades were below rather than above the roller. The illustration shows the machine upside down to permit easier comparison with the '534 and Weidman machines.

APPENDIX C

Sept. 20, 1971 W. H. BARR 3,605,534

BOARD CUTTING MACHINE

Filed May 24, 1967 5 Sheets-Sheet 1



William H. Barr
J. Vincent Martin
Joe E. Edwards
Mills & Gill
ATTORNEYS

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Sept. 20, 1971 W. H. BARR 3,605,534

BOARD CUTTING MACHINE

Filed May 24, 1967 5 Sheets-Sheet 2

Fig. 8

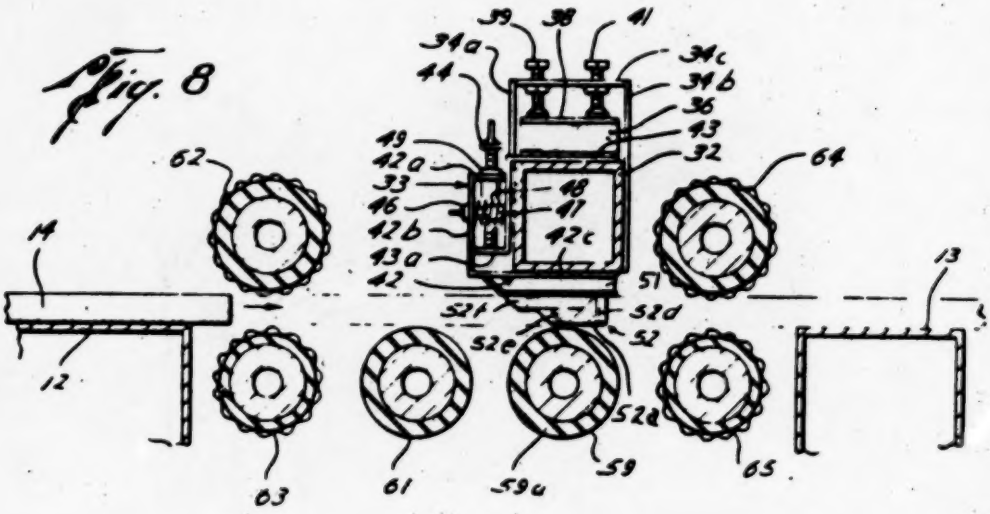


Fig. 9

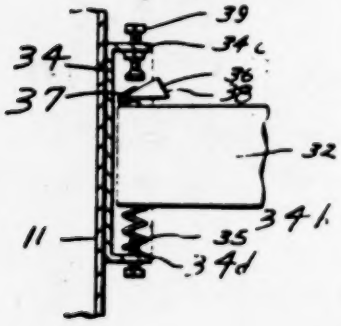


Fig. 10

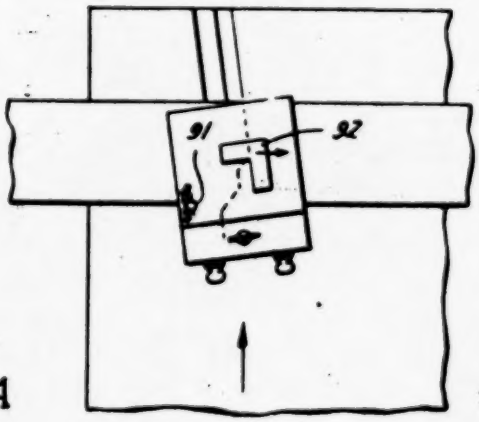
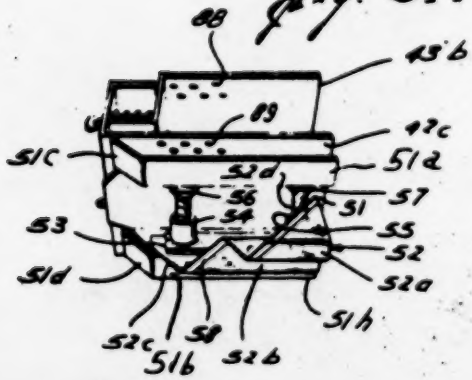


Fig. 3A



William H. Barr
INVENTOR
By J. Vincent Martin
Joe E. Edwards
111 W. Jackson
ATTORNEYS

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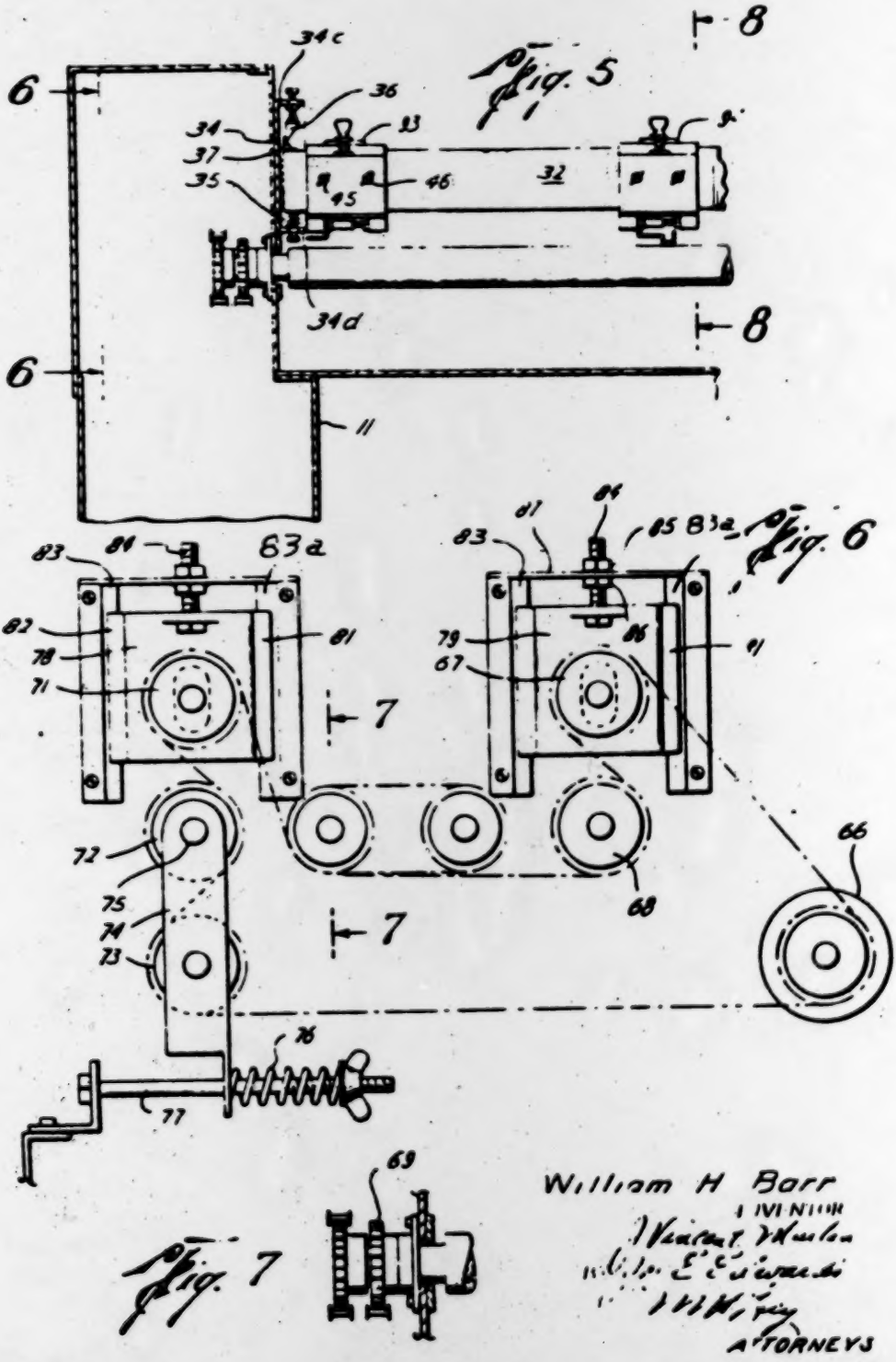
Sept. 20, 1971 W. H. BARR 3,605,534

BOARD CUTTING MACHINE

Filed May 24, 1967 5 Sheets-Sheet 3



William H Barr
INVENTOR
Wallace & Wallace
Wallace & Wallace
ATTORNEYS

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Sept. 20, 1971 W. H. BARR 3,605,534

BOARD CUTTING MACHINE

Filed May 24, 1967 5 Sheets-Sheet 4

Fig. 11A

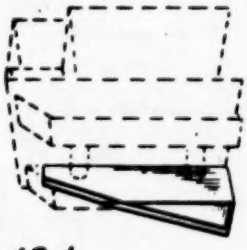


Fig. 11

Fig. 12A

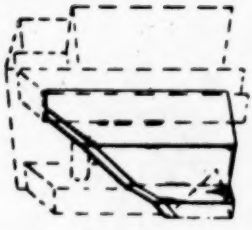


Fig. 12

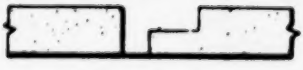


Fig. 13A

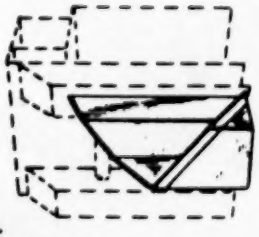


Fig. 13

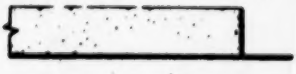


Fig. 14A

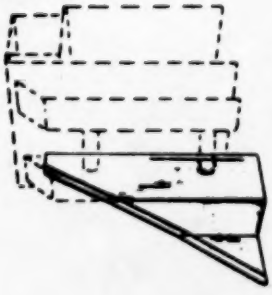


Fig. 14

William H. Barr
INVENTOR
by Vincent Martin
Joe E. Edwards
V. V. Jay
ATTORNEYS

C-5

Sept. 20, 1971 W. H. BARR 3,605,534

BOARD CUTTING MACHINE

Filed May 24, 1967 5 Sheets-Sheet 5

Fig. 15A

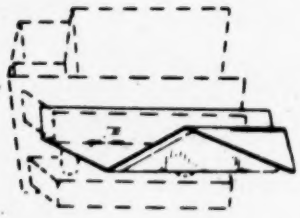


Fig. 15

Fig. 16A

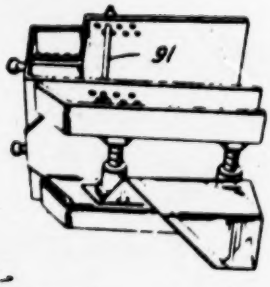


Fig. 16

Fig. 17A

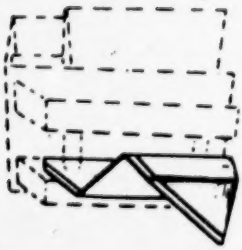


Fig. 17

Fig. 18

Fig. 18A

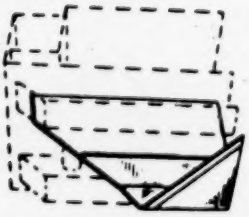
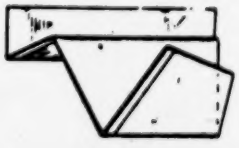


Fig. 19



William H. Barr
INVENTOR
J. Vincent Martin
BY Fox E Edmonds
McKay
ATTORNEYS

UNITED STATES PATENT OFFICE

3,605,534

Patented Sept. 20, 1971

BOARD CUTTING MACHINE

William H. Barr, 8418 Broadway,

San Antonio, Tex. 78209

Filed May 24, 1967, Ser. No. 640,948

Int. Cl. B26d *3/06*

U.S. Cl. 83—5 16 Claims

ABSTRACT OF THE DISCLOSURE

This invention relates to board cutting machines, and more particularly to machines for forming structures from fibrous board having an impermeable facing on one or both sides. The machine cuts grooves in a board of material which permits the board to be folded into a rectangular form to provide a duct. The board may also be wrapped around any structure for insulation, such as pipe or structural members.

Machines have heretofore been used to cut V-shaped grooves in fiber board to form ducts. After the V-grooves are formed, a router or a hand tool has been used to form a shiplap-type joint on one side of the board and to remove fibrous material from the other side to leave a flap of impervious materal so that when the duct is formed the joint will be a shiplap joint with a flap to overlap the joint. With the V-type duct using a shiplap closure joint, different pressures are present in the several

joints. When not subjected to any external force, these different pressures cause the duct to be nonrectangular. The angles of the sides of the duct may vary several degrees from right angles.

Where V-type duct work is used, a branch duct is not connected to the common duct work. Special fittings must be used to provide a small section in a run of duct with all shiplap joints into which a branch duct can be fitted.

Pressure on a V-type duct may result in opening of the V-grooved corners to the extent that the corner opens up and permits the insulation material to separate. This does not happen in shiplap joints. Negative pressure may also separate the insulation in a V-groove, but not a shiplap groove.

Shiplap-type joints have been cut in the past by simultaneously cutting through the backing material. The mating board would have fibrous material removed by hand to provide a flap for completing the joint.

It is an object of this invention to provide a machine which in a single pass will suitably groove an insulation board while leaving the moisture barrier intact for forming into a duct or insulator which will maintain a rectangular configuration.

Another object is to provide a machine for grooving insulation board for making ducts or insulators in which the end of the board may have a shiplap joint formed thereon which will mate with shiplap surfaces in the side of a run of duct work, after a panel has been removed, to provide branch ducts and 90° turns without special fittings or special tools.

Another object is to provide a machine for cutting duct-forming material to remove substantially all fibrous material along a desired width from the facing on the board to permit proper folding of the board into rectangular duct form.

Another object is to readily remove fibrous material from the edge of a board of duct-forming material to leave a flap of facing for lapping a joint simultaneously with cutting the other joints in the material.

Another object is to provide a machine for forming a duct insulation board in a single pass through the machine which will cut shiplap-type joints without cutting through the facing on the material.

Another object is to provide a machine for removing substantially all fibrous material from duct board while leaving the facing on one side thereof intact.

Another object is to provide a single blade for cutting a groove in insulation board.

Another object is to provide a machine for cutting joints in fibrous insulation board to permit folding of the board into ducts or insulators of consistent shape and size. Another object is to provide a machine for forming ducts from fibrous insulation board which will form a transition duct to connect ducts of different sizes.

Other objects, features and advantages of the invention will be apparent from the drawings, the specification and the claims.

In the drawings, wherein an illustrative embodiment of this invention is shown, and wherein like reference numerals indicate like parts:

FIG. 1 is a perspective view of a machine constructed in accordance with this invention grooving a board to be formed into a duct or insulator;

FIG. 2 is a diagrammatic view of a fragment of a board cut by the machine of FIG. 1 which when folded will give a square duct;

FIG. 3 is a sectional view through a fragment of board for forming ducts showing one of the joints;

FIG. 3A is a digrammatic view of a cutter for forming the cut shown in FIG. 3;

FIG. 4 is an exploded diametrical view of fragments of a duct with parts broken away illustrating joints in a run and a 90° bend;

FIG. 5 is a view along line 5—5 of FIG. 1 showing a portion of the machine in vertical elevation and a portion of the machine in vertical cross-section;

FIG. 6 is a partial view along line 6—6 of FIG. 5 on an enlarged scale showing the drive mechanism for the machine and the mounting thereof;

FIG. 7 is a fragmentary view along the line 7—7 of FIG. 6 illustrating the double sprocket on this roller;

FIG. 8 is a view along the line 8—8 of FIG. 5 illustrating the relationship of the rollers and cutter;

FIG. 9 is a fragmentary view partially in vertical cross-section and partially in elevation illustrating the mounting of the cutter support;

FIG. 10 is a fragmentary bird's eye view of a cutter traveling along its support as a board of material passes

through the machine to make a transition or diagonal cut in the board;

FIG. 11 shows a particular cut which may be formed in a board, and FIG. 11A is a diagrammatic view partially in full lines and partially in phantom illustrating the cutter for making this cut;

In like manner, FIGS. 12 through 18 and their associated FIGS. 12A through 18A illustrate other cuts which may be made in board and the associated cutter for forming these cuts, with FIG. 16A shown in its entirety in full lines and showing the means for causing the cutter to travel along its support and make a diagonal cut in the board.

FIG. 19 is a diagrammatic view of a V-type knife blade constructed in accordance with this invention.

Referring first to FIG. 1, the illustrated machine includes supporting legs or columns 10 and 11 held in spaced relationship by a table top 12 and a table top 13 (FIG. 8). The upper surface of the table tops 12 and 13 provide a guide surface for a board of fibrous material 14 passing through the machine.

The board of material 14 may be any suitable material which will serve as insulation for duct work, and includes a facing on one or both sides thereof. For instance, there is presently available from the Owens-Corning Fiberglas Corporation an insulation board made of fiberglass held by a suitable binder known as "Duct Board." On one face of the board there is provided an impervious facing which may be aluminum foil, aluminum foil with a fiberglass mat, or aluminum foil, a fiberglass mat and a vinyl sheet. It will be appreciated that the machine of this invention

can be used with any suitable insulation material having a facing thereon. In FIG. 3, the fiberglass material is shown at 15 and the facing at 16.

In accordance with this invention, the passing of the board 14 through the machine will result in shiplap or other suitable cuts which will remove substantially all of the fiberglass and binder therefor from a desired area such as indicated generally in the cut shown at 17 in FIG. 3. As shown in FIG. 2, a board may have three shiplap cuts formed therein, such as 18, 19 and 20. An additional shiplap cut may be provided in the end as at 21 and material removed from the other end as at 22 to leave a flap 23 of facing material. When the thus formed board is folded into rectangular configuration with the facing material on the exterior, it will assume the shape shown in FIG. 4, and the flap 23 will overlap the shiplap joint 21. By suitably taping the flap 23 in position, or by sticking it to the underlying facing material with a suitable bonding agent, a firm, rigid, rectangular duct such as shown at 24 in FIG. 4 will result.

After the board 14 has been cut, it may be turned 90° and two shiplap cuts made in the end face thereof, preferably one male and the other female. This is shown in the duct 24 in FIG. 4 with the male shiplap joint at 25 and the female at 26. If desired, a closure plate 27 may be fabricated to close the end of the duct.

If it is desired to turn a 90° corner, or to take a branch duct off a main duct, such as at 24, a window may be provided by cutting the duct 24 along the line 28 and removing the end piece. The removed piece will provide the closure plate 27. If the branch duct is not at the end of a run, two cuts will be made spaced by the width of

the branch duct to be inserted. The shiplap joints on the run of duct work 24 will cooperate with the male shiplap joint 29 on the branch duct 31 to position the branch duct in the main duct 24. Suitable taping of the joint will complete the joinder of the branch and main duct.

Reference is made to FIGS. 5 through 9 to show the construction of the machine.

The machine includes a support 32 on which a plurality of cutters indicated generally at 33 are mounted. The support 32 may take any desired form. The box section is preferred to permit use of light material, as the support is supported only on each end and may be up to ten feet or more in length.

To facilitate removal and replacement of the cutters, the bar is mounted with a quick release mechanism which permits the bar to be moved upwardly. One of these mechanisms is provided at each support pillar 10 and 11. A base member 34 is suitably secured to the upright 11 in any desired way such as welding, bolting, etc. The base plate has vertically extending out-turned flanges 34*a* and 34*b* on each side as shown in FIG. 8. Similar flanges 34*c* and 34*d* are provided at the top and bottom of the base member 34. The side flanges 34*a* and 34*b* hold the support 32 against horizontal movement.

The support 32 rests on a pair of springs 35 which are mounted side by side on the flange 34*d*. These springs, one of which is shown in FIG. 5, underlie opposite sides of the support 32.

To releasably latch the support in place, it has a lock member 36 hinged to its upper surface by hinge 37. The member 36 has an upper flat face 38. A pair of spacing

studs 39 and 41 extend through the upper flange 34*c* and engage the flat face 38 of the lock member 36. It will be appreciated that adjustment of the screws 39 and 41 determine the vertical position of the support 32. By pressing down against the resistance of springs 35, the lock member 36 may be freed and turned downwardly onto the top of support 32, thus giving a space between the lock member and the stop studs 39 and 41 which will permit the support to be raised by springs 35, or other means, to provide additional room for handling of the cutters 33. FIG. 9 shows the release position.

The cutters 33 may have any desired means for positioning them on the support 32. For example, the cutters 33 may have a carrier which includes a J-shaped lower member 42 and a Z-shaped upper member 43. A stud 44 is threaded through the short leg 42*a* of the J and engages leg 43*a* of the Z-shaped member. A pair of studs 45 and 46 extend through the base 42*b* of the J-shaped member and are threadedly received in nuts 47 which are secured to the Z-shaped member. Suitable small springs 48 surround the stud and nut to urge the Z-shaped member away from the J-shaped member. The studs 46 have a loose fit with the base 42*b* of the J-shaped member, and thus tightening of the stud 44 in its nut 49 will clamp the carrier onto the support 32. It will be appreciated that the structure just described is a simple, inexpensive method of clamping the carrier to the support 32, and any suitable system could be employed.

The carrier has welded to the bottom or long leg 42*c* of the J-shaped member an inverted channel 51 having out-turned flanges 51*a* and 51*b* (see FIG. 3A). On the front side the flanges are separated from the remainder of the channel and bend upwardly as at 51*c*

and 51*d*. Thus a sleigh-like member is formed to avoid any possibility of the board 14 hanging up on the channel member.

A suitable knife blade indicated generally at 52 is held between the legs of the channel member 51 by a locking arrangement. This locking arrangement includes a bar 53 having nuts 54 and 55 welded thereto. Suitable studs 56 and 57 are threaded into the nuts 54 and 55, respectively. Thus by positioning the knife blade in place and the locking mechanism between the channels and backing off the studs 56 and 57 until they jam between the legs of the channel member, there results a locking of the knife blade in place.

The knife blade is a thin blade of any suitable metal, such as steel, having a cutting edge 58.

It will be appreciated that the support 32 is a beam supported from each end. Desirably, the support 32 is free of any additional support. The carriers 33 are fabricated from thin commercial plate. As it is desirable to avoid the necessity of holding close tolerances on these parts, some means is preferably provided for relating the knife blade 52 to the board 14 as it passes through to be certain that the knife is correctly positioned. The means for relating the knife blade and the board is provided by a blade support means which cooperates with the blade to position and hold the blade in the desired relationship to the board. This blade support means may take any desired form which provides a support for the blade.

Preferably the blade support means helps to avoid tearing or bunching up of the facing material. Thus, it is preferred that a roller 59 be utilized to avoid any tendency of the blade support means to interfere with free passage

of the facing material over the blade support means. It is further preferred that the blade support roller 59 have a peripheral speed which is slightly greater than the speed of the board 14 passing thereover. This will tend to avoid any tendency of the facing material to bunch up, as it will be held taut as it passes under the knife

The knife blade 52 is specially designed to cooperate with the blade support 59. This special design includes a section of the blade 52*a* which extends horizontally or parallel to the plane of movement of the board across the machine. Thus the section of the blade 52*a* lies in a plane tangent to the roller 59 and provides a bearing area.

The support roller 59 is mounted in journals at opposite ends of the machine in the legs 10 and 11. Thus, the support roller, being supported at each end, will act as a beam in the same manner as the cutter support 32. In order to compensate for differences in bending of the cutter support 32 and the support roller 39, as well as tolerances in the structure, one of the supports 59 and the blade 52 is provided with resilient means which prevents the blade support means from exerting excessive force on the section 52*a* of the knife blade. Preferably this resilient means is provided by section 52*b* of the knife blade. Section 52*b* extends generally transverse of the machine or horizontally. In other words, some portion of the knife between the section 52*a* and the mounting of the knife to the carrier 33 extends in some direction other than normal to the plane of the section 52*a*. Preferably, this is provided by the section 52*b* which extends generally horizontally, but it will be appreciated that any configuration which provides some portion of the blade which is not normal to the surface 52*a* will permit the knife to bend and act in the manner of a spring so that excessive pres-

sure cannot be applied to the knife through the support roller 59. With the spring action defined above, the lowermost portion of the knife blade, which will remove the fibrous material adjacent the facing, is correctly positioned for this task, and yet is free to give sufficiently to permit the facing material to pass between the knife blade and the support means.

In accordance with this invention, the cutting edge on the knife blade extends rearwardly from the point at which a cut is begun. Thus the cutting edge extends rearwardly from the point 52c which first engages a board to be cut. The cutting edge extends rearwardly in a continuous manner, no matter what direction it may take otherwise to perform the desired cutting action in the fibrous material. This eliminates any change in direction of the cutting adge which might result in fibers stacking up in the change of direction junction. Also, the end 52d of the knife blade is free from the carrier. If it were attached to the carrier, it would be possible for the fibrous material to tend to hang up at the end of the blade at the point of attachment. By leaving the end of the blade free, this problem is overcome.

The positioning of the support means 59 in the fore and aft direction of the machine relative to the section of the knife blade 52a which it supports is important. If it is positioned too far forward, it will interfere with the facing material moving under the knife blade. If it is positioned too far to the rear, the knife blade may possibly raise up and increase the distance between the portion 52a of the blade and the support means 59, and leave an excess amount of fibrous material on the facing material. Thus, the support means at the point where it engages the knife blade section 52a, with no board 14

in place, should be about 1/8" to 1/4" rearwardly of the frontmost cutting edge of the section 52a of the knife blade. A greater distance could be used, but it would not give as satisfactory results as when the point of engagement is as defined above. It will be appreciated that the support means 59 could engage the knife blade at a much further position to the rear, as engagement at any point will perform the function of holding the knife blade in the proper position. It will permit, however, the fiber board to raise up a slight distance and leave a slight amount of fibrous material on the facing material. While this is not the preferred product, it is an acceptable product as this slight amount of material can be hand-cleaned or, if not too great, can be tolerated as the fibrous material will give when the duct work is folded into a rectangular shape.

It will be appreciated that with the form of carrier and knife blade illustrated, room is needed to withdraw the carrier toward the front of the machine to remove it from the bar. In order to support and guide the board of material being worked on in this space, a guide roller 61 is provided. Like roller 59, guide roller 61 is turned at a rate such that its peripheral speed is slightly greater than the speed of the board 14 passing therethrough so that its tendency is to bend the front end of the board upwardly, thus holding it in proper position for introduction into the knife.

Means are provided for passing the board of fibrous material 14 through the machine. Preferably this means is a pair of lead feed rollers 62 and 63 with the peripheral surfaces thereof fluted to firmly grip the board and pass it through the machine. A pair of trailing rollers 64 and 65 grip the board after it has passed through the knife

52 and pull it through the machine. These rollers also have fluted surfaces. It will be appreciated that the rollers 65, 59, 61 and 63 are positioned so that their uppermost surfaces lie in a common plane.

Reference is now made to FIGS. 5, 6 and 7 wherein the drive mechanism for the rollers is shown. A suitable motor 66 drives the several rollers through a chain which passes over a sprocket 67 on roller 62, thence over a sprocket 68 on roller 63, and thence over a sprocket 69 (FIGS. 5 and 7) on the support roller 59. From this point the chain trains over a sprocket 71 on the trailing feed roller 64 and a sprocket 72 on the trailing roller 65. The chain then passes over idling sprocket 73 and returns to the motor in continuous fashion. To maintain the chain taut, sprocket 73 is carried by an arm 74 which is pivotally mounted at 75 on the same axis as sprocket 72. The arm is urged in a direction to tighten the chain by a spring 76 held in compression on rod 77 which is suitably fastened to the support 11.

In order to provide for vertical adjustment of the top feed rollers 62 and 64, they are journalled in vertically movable supports 78 and 79. These supports have channels 81 and 82 on opposite sides thereof which slide on flanges 83 and 83a. Suitable bolts 84 are carried in the members 78 and 79 and by movement of the nuts 85 and 86 the bolt is positioned relative to flanges 87 through which the bolts pass to selectively adjust the position of the top rollers.

Reference is now made to FIGS. 11 and 11A through 19. These figures show cutters which have blades 52 of different configuration than that shown in FIG. 3A. FIGS. 11 and 11A through 18 and 18A show the particular blades and the particular cuts which they make in board

to permit any desired type of operation in forming duct work from board with a facing thereon. FIG. 19 shows a V-type blade in accordance with this invention. This blade may be used for special situations, such as removing V-shaped material to permit the board to be wrapped about a pipe. It will be appreciated that the blades might additionally take other configurations if desired.

It might be noted that the blade in FIGS. 11A, 14A and 15A do not have a portion which lies adjacent the support roller 59. As shown in FIG. 5, blades of this type are spaced upwardly from the support roller and no cut is made close to the facing. These types of blades are used at the extremities of the board. As they are not cutting close to the facing material, their positioning is not too critical.

In some instances, it is desirable to make a duct which changes size. For this purpose, a plurality of holes 88 are provided in leg 43b of the Z-shaped portion of the carrier, and similar holes are provided at 89 in the leg 42c of the J-shaped member of the carrier. These holes are provided to receive a cylindrical pin 91 (FIGS. 10 and 16A). With the pin in position in the desired hole, the carrier is placed on the support bar 32 but is not clamped in place. The clamps are tightened sufficiently to hold the knife in proper position but not sufficiently to prevent the carrier from moving along the support bar 32.

It will be noted that each knife has a section which extends in a vertical plane across the machine. Thus, when the pin 91 is not in place, this vertical section of the knife extends parallel to the direction of travel of the board 14 through the machine. In FIG. 8, these are three such vertical sections 52*d*, 52*e* and 52*f*. When the carrier is held at a slight angle to a perpendicular to the support

member 32, these blade sections also extend at an angle to the direction of travel of the board and, as they pass through the board, they will cause the carrier to move along the support 32 and make a diagonal cut in the board. By the use of the traveling cutters, shiplap grooves may be formed in a board which, when folded into rectangular form, will have one end which is of a different size than the other end.

It might be noted that on top of the carrier in FIG. 10 there is shown a block 92. This block is fastened to the top surface of leg 43*b* of the Z-shaped member and is used as a measuring point to measure the distance between the several cutters. The block may take any desired shape and may be positioned relative to the particular knives used to facilitate measurement. Similar blocks are also shown at 93 and 94 on the two cutters shown on FIG. 5. It is omitted from the cutter of FIG. 8 for clarity of the drawings.

The foregoing disclosure and description of the invention are illustrative and explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. A cutting machine comprising,
a support,
a cutter on said support,
means for feeding a board of fibrous material having a facing on at least one side thereof across the cutter from the front to the rear of the machine.

said cutter having knife blade means which is formed to produce the desired cut in a board and includes a section extending parallel to the plane of movement of the board across the machine,

and blade support means effective on said parallel extending section of said blade means to support said section while permitting the facing on a board being cut to pass between the blade support means and said section of the blade means,

said blade support means underlying said section of said blade means,

one of said knife blade means and said blade support means including resilient means preventing said blade support means from exerting excessive force on said section of said knife blade means.

2. A cutting machine comprising,

a support,

a cutter on said support,

means for feeding a board of fibrous material having a facing on at least one side thereof across the cutter from the front to the rear of the machine,

said cutter having knife blade means which is formed to produce the desired cut in a board and includes a section extending parallel to the plane of movement of the board across the machine,

and blade support means effective on said parallel extending section of said blade means to support said section while permitting the facing on a board being cut to pass between the blade support means and said section of the blade means,

said blade support means underlying said section of said blade means in an area just rearwardly of the forwardmost point of the cutting edge on said section,

one of said knife blade means and said blade support means including resilient means preventing said blade support means from exerting excessive force on said section of said knife blade means.

3. A cutting machine comprising,

a support,

a cutter on said upport,

means for feeding a board of fibrous material having a facing on at least one side thereof across the cutter from the front to the rear of the machine,

said cutter having knife blade means which is formed to produce the desired cut in a board and includes a section extending parallel to the plane of movement of the board across the machine,

said knife blade means having a cutting edge extending rearwardly of the machine along its entire length from a point at which the cut in a board is commenced,

and blade support means effective on said parallel extending section of said blade means to support said section while permitting the facing on a board being cut to pass between the blade support means and said section of the blade means,

said blade support means underlying said section of said blade means in an area just rearwardly of the forwardmost point of the cutting edge on said section,

one of said knife blade means and said blade support means including resilient means preventing said blade support means from exerting excessive force on said section of said knife blade means.

4. The machine of claim 1 wherein a plurality of cutters are mounted on said support.

5. The machine of claim 3 wherein means are provided for causing said cutter to travel along said support in response to movement of a board through the machine.

6. A cutting machine comprising,
a support,
a cutter on said support,
means for feeding a board of fibrous material having a facing on at least one side thereof across the cutter from the front to the rear of the machine,
said cutter having knife blade means which is formed to produce the desired cut in a board and includes a section extending parallel to the plane of movement of the board across the machine,
said knife blade means having a cutting edge extending rearwardly of the machine along its entire length from a point at which the cut in a board is commenced,
a support roller underlying and supporting said section of said knife blade means at an area rearwardly of the foremost point of the cutting edge on said section while permitting the facing on a board being cut to pass between the roller and said section of the knife blade means,
said knife blade means including resilient means preventing said roller from exerting excessive pressure on said section of said knife blade means.

7. The machine of claim 6 wherein the peripheral surface of said roller travels at a rate slightly greater that a board fed by said feeding means.

8. The machine of claim 6 wherein a guide roller is positioned immediately forward of said support

roller and the peripheral surfaces of both said guide roller and support roller travel at a rate slightly greated than a board fed by said feeding means.

9. A cutting machine comprising,

a support,

a plurality of cutters on said support,

a pair of front feed rollers and a pair of rear feed rollers on opposite sides of said support for feeding a board of fibrous material having a facing on at least one side thereof across the cutters,

each cutter including a knife blade mounted on a carrier,

said knife blade having a first section extending parallel to the plane of movement of the board across the machine for cutting fibrous material from the facing and a second section between the carrier and first section which is not perpendicular to the first section to give resiliency to the knife blade,

a guide roller between the front feed rollers and the plurality of cutters for guiding the board to said knife blades,

a support roller underlying and supporting said first blade section while permitting the facing on a board being cut to pass between said support roller and said second blade section,

the surface of said roller supporting said second blade section lying in an area just rearwardly of the forwardmost portion of said first blade section.

10. The machine of claim 9 wherein the cutting edge on said knife blade extends rearwardly of the

machine along its entire length from a point at which the cut in a board is commenced.

11. The machine of claim 9 wherein the guide and support rollers run at a faster speed than the feed rollers.

12. The machine of claim 9 wherein means are provided for causing the cutters to travel along said support while making a cut in response to movement of a board through the machine.

13. The machine of claim 9 wherein each blade includes a section extending at a right angle to said first section and generally in the direction of travel of a board through the machine,
and means mounting at least one of the carriers for sliding movement along the support with said right angle section extending at an angle to the direction of travel of a board through the machine whereby the right angle section will cause the carrier to travel along the support while making a cut.

14. As a subcombination a cutter for cutting a fibrous board having a facing on at least one side thereof comprising,
a carrier having a clamping surface,
a knife blade mounted on the carrier,
said knife blade having a first section extending parallel to the plane of movement of a board across the knife blade surface for cutting fibrous material from the facing and a second section between the carrier and first section which is not perpendicular to the first section to give resiliency to the knife blade,

said knife blade having a cutting edge beginning adjacent its mounting on the carrier at the front end of the carrier and extending toward the rear of the carrier along the entire length of the blade.

15. The cutter of claim 14 wherein the knife blade at the rearmost end of the cutting edge is spaced from the carrier.

16. As a subcombination, a cutter for cutting a fibrous board having a facing on at least one side thereof comprising,

a carrier having means for fastening the cutter to a machine for cutting board,

a knife blade mounted on the carrier,

said knife blade having a first section extending parallel to the plane of movement of a board through the machine for cutting fibrous material from the facing and a second section between the carrier and first section which is not perpendicular to the first section to give resiliency to the knife blade.

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FRANK T. YOST, Primary Examiner

U.S. Cl. X.R.

83—428, 436, 579, 662, 698

APPENDIX D

IN THE
DISTRICT COURT OF THE UNITED STATES
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

CA No. 75-H-394

WEIDMAN METAL MASTERS CO., INC.,
Plaintiff,

v.

GLASS MASTER CORPORATION,
and FRED F. WILLSON,
Defendants and Counterclaim Plaintiffs,

v.

WEIDMAN METAL MASTERS CO., INC.
and ROGER F. WEIDMAN,
Counterclaim Defendants.

EXCERPT OF PROCEEDINGS

February 21, 1978

D-2

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WEIDMAN METAL MASTERS CO., INC.,
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and ROGER F. WEIDMAN,
Counterclaim Defendants.

I, Yvette F. Perry, Official Court Reporter for the United States District Court for the Southern District of Texas, Houston Division, do hereby certify that the following is a true and complete excerpt of proceedings had in the above styled and numbered cause before the Honorable John V. Singleton, Jr., United States District Judge, on the 21st day of February, A.D. 1978.

WITNESS MY OFFICIAL HAND at my office in Houston, Harris County, Texas, on this the ____ day of April, A.D. 1978.

YVETTE F. PERRY

APPEARANCES

FOR THE PLAINTIFF AND COUNTERCLAIM DEFENDANTS:

Messrs. Arnold, White & Durkee
Attorneys at Law
2100 Transco Tower
Houston, Texas 77027

By Mr. Rodney K. Caldwell

FOR DEFENDANTS AND COUNTERCLAIM PLAINTIFFS:

Messrs. Vinson, Elkins, Searls,
Connally & Smith
Attorneys at Law
First City National Bank Building
Houston, Texas 77002

By Mr. M. H. Gay

MR. GAY: Judge, we appreciate your courtesy, sir.

THE COURT: I don't know of any courtesy.

MR. GAY: Well, you are always good to us in letting us try our case and putting it on. We appreciate it.

THE COURT: All right.

You have the burden of proof on infringement.

MR. GAY: Yes, sir.

THE COURT: What do you say?

MR. GAY: I say the plaintiff infringes, Your Honor.

THE COURT: Let me say how I think this situation is with reference to these two machines.

It occurs to me that the Barr patent accomplishes the results that it accomplished.

First, let me back up and say that it is apparent from the evidence that the two machines accomplish the same result.

MR. GAY: Yes, sir.

* * *

MR. GAY: It is probably the basic Supreme Court case, I believe, yes, sir.

MR. CALDWELL: Certainly one of the most quoted cases.

THE COURT: All right. There is no question about the fact that, in essence, this was a sort of a new field at the time all of these came about; I mean, performing air conditioning and heating duct work with fiber board as opposed to doing it with sheet metal.

MR. GAY: Yes, sir. That is what the evidence shows.

THE COURT: And you had to have some method of cutting the fiber on the fiber boards so that you could form the ducts, and various tools were developed to do that. And we are talking now about the hand tools that were in evidence, both the orange—I mean, the red, the gray and I assume the orange tool. So that, in essence, those tools were sort of prior art in this field.

But it was expensive to do it that way because it took a lot of time, a lot of manpower, a lot of hours, and so on. So it was better to find some place to do it mechanically, if you could find some place to do it mechanically.

No question about the fact that the Forrest machine, insofar as the evidence in this case discloses, seems to me to be the first machine that did that, mechanically. True enough, it did not cut the type of groove that ended up to be the most desirable type groove. It cut a V-type and when you formed the duct with a V-type, it is apparent to the Court from the evidence that that duct is not as substantial a duct or as good a duct as if it were cut with some other type of groove.

So they developed this modified shiplap cut, and you had a hand tool that did that.

Now, Mr. Barr comes along and he develops a machine that in one pass can cut the modified shiplap and also skim a flap over here to kind of weld together the duct after it is formed.

The way he did it, it seems to me—first, the ducts have an insulation, an aluminum foil base around it. So, some way, in order to form this thing up, you've got to cut the fiberglass away—or most— away from that aluminum foil to make the grooves of the modified shiplap, first, and, second, to make the flap so you can weld them together. You've got to cut that stuff away.

Now, he did it by mounting a blade over a roller, almost directly over a roller, over the center of the roller. The patent says that it is preferable for that blade to be from a quarter to an eighth of an inch forward of the center line of the roller and that the roller and the blade act together in a manner where the duct board is forced up to that point and, some way, this blade has to cut under the fiberglass, the fiber, and just above the foil, just as close as possible.

And through his method, these two, the blade and the roller under it, were in relationship to each other, as I have tried to describe, and the board is forced through there and the blade cuts as near that fiber as possible.

I am really not explaining it very well in words. I think I can visualize it.

And that performed the work and did a good job.

Now, Mr. Weidman comes along with a machine that accomplishes the same result, but his machine does it, as he says—and that's the best way I know how to describe it—all he did was just put a knife back of a roller and let the roller just roll the board into the knife, and then it just sort of did its own thing as it went on by. There was no—I don't know how to say it—no forcing the fiber from under the—through the blade. It was more of a cutting action.

The Barr machine is a sort of a forcing action as well as a cutting action, and it takes that relationship. I think that is the main thing, the Barr machine, and the thing that was emphasized in the patent is the relationship between the cutting blade and the roller. That relationship is critical. If you put it too far forward, it will not cut enough of the fiber away. If you put it too far back, it will foul up the tin foil, the foil.

The Weidman machine does not work in that same way, it does not seem to me. You do not have the same relationship between the roller, the support—what you call the support roller—and the blade. He just hangs a blade there. There is no real relationship between the two; at least, on an up and down basis, if that is the right

word. His blade is aft of the forward movement of the board as it goes through the machine.

It does not make any difference, really, how far aft he puts it. How far aft he puts it depends upon how close he wants to skim the fiber away from the foil. But he never gets it right up against the roller, so that there is not the same relationship between the roller and the cutting blade as there is in the Barr machine.

That is the way I look at it. That is what the evidence in this case has shown me, that the Barr method of cutting is substantially different from the Weidman method of cutting.

I am not engineer enough to explain it any better than what I have already explained it. It's just, to me, the way the Barr machine is—where is that thing?

That blade has got to be down on the roller. It won't work otherwise. It's got to be down on the roller, almost at the center line of the roller. That way, the forcing powers forcing the board through the machine causes the first cut to be made and then it just goes on through, whereas the Weidman comes over the support bar and it is bent down like these pictures show, and then the blade picks it up and cuts it. There is not the same forcing motion. I don't know how to put it.

The Barr seems to be more of a forcing through there and the Weidman seems to be more of a cutting action.

Consequently, I cannot see that the Weidman machine performs the same function in substantially the same way. It performs the same function, but in a substantially different way. Whichever way is the best, I don't think is for a Court to decide.

But I do not think that the Weidman machine infringes upon that particular claim; if it's claim one and two, fine, I think they are almost the same to me. I believe two is a little more narrow than one, or is it the other way around? I think two is a little more narrow than one.

Two really is the claim that I am trying to articulate, I believe.

And it takes that relationship, as I repeat, the relationship between the roller or support roller and the blade that is critical to the Barr machine. That same relationship is not present in the Weidman machine.

That is the way I look at it.

Now, whatever anybody wants to say—anybody can change my mind—fine. But that is my view of what I have tried to understand.

Unfortunately, I am sure it is not stated in a very good way.

MR. CALDWELL: I would only

* * *

APPENDIX E

IN THE
DISTRICT COURT OF THE UNITED STATES
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

CA No. 75-H-394

WEIDMAN METAL MASTERS CO., INC.,
Plaintiff,

v.

GLASS MASTER CORPORATION,
and FRED F. WILLSON,
Defendants and Counterclaim Plaintiffs,

v.

WEIDMAN METAL MASTERS CO., INC.,
and ROGER F. WEIDMAN,
Counterclaim Defendants.

EXCERPT OF PROCEEDINGS

February 21, 1978

IN THE
DISTRICT COURT OF THE UNITED STATES
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

CA No. 75-H-394

WEIDMAN METAL MASTERS CO., INC.,
Plaintiff,

v.

GLASS MASTER CORPORATION,
and FRED F. WILLSON,
Defendants and Counterclaim Plaintiffs,

v.

WEIDMAN METAL MASTERS CO., INC.,
and ROGER F. WEIDMAN,
Counterclaim Defendants.

I, Yvette F. Perry, Official Court Reporter for the United States District Court for the Southern District of Texas, Houston Division, do hereby certify that the following is a true and complete excerpt of proceedings had in the above styled and numbered cause before the Honorable John V. Singleton, Jr., United States District Judge, on the 21st day of February, A.D. 1978.

WITNESS MY OFFICIAL HAND at my office in Houston, Harris County, Texas, on this the 27th day of February, A.D. 1978.

YVETTE F. PERRY
Official Court Reporter

APPEARANCES

FOR THE PLAINTIFF AND COUNTERCLAIM DEFENDANTS:

Messrs. Arnold, White & Durkee
Attorneys at Law
2100 Transco Tower
Houston, Texas 77027

By Mr. Rodney K. Caldwell

FOR DEFENDANTS AND COUNTERCLAIM PLAINTIFFS:

Messrs. Vinson, Elkins, Searls,
Connally & Smith
Attorneys at Law
First City National Bank Building
Houston, Texas 77002

By Mr. M. H. Gay

THE COURT: And that is what you are trying to get the Court, it seems to me, to hold.

MR. GAY: No, sir. Here is a piece of duct board that was cut. It has a modified shiplap groove in it, and it was not cut in accordance with the teaching of Barr.

THE COURT: You mean that was cut with the Forrest machine?

MR. GAY: This was cut with the Forrest machine.

THE COURT: Okay. And all you had to do to make it a better cut is to adjust that support bar, support roller, a little tighter and it will cut a little better than that, wouldn't it?

MR. GAY: I don't know; I think it would cut through the material.

THE COURT: No. You could do it. You could adjust the Weidman to where it cuts through the material. But they both do the same thing in the same way, it seems to me.

MR. GAY: Let me show you—

THE COURT: I would go almost this far: If the Forrest machine and the Weidman machine were before me, whichever one of them got there first, I'd say the other one infringed.

MR. GAY: Let me point out to the Court that when they cut this material—here is another piece of board.

THE COURT: But I don't think they infringed on your patent.

MR. GAY: Well, Your Honor, I seem to lack words to—

THE COURT: No, you don't.

MR. GAY: —to show you the relationship.

THE COURT: You don't lack words. I understand what you're saying. I just cannot, as a Court, read that literal construction into your patent, I think that I would be, as a Court, reading more into that patent than is actually there.

Now, that is what has come out of my view of the evidence.

NO. 80-1194

IN THE

Supreme Court of the United States

OCTOBER TERM, 1980

WEIDMAN METAL MASTERS CO., INC.,
Petitioner,

v.

GLASS MASTER CORPORATION
and FRED F. WILLSON,
Respondents.

On Writ Of Certiorari To The United States Court Of Appeals For The Fifth Circuit

BRIEF FOR RESPONDENTS

M. H. GAY
VINSON & ELKINS
First City National Bank Building
Houston, Texas 77002
(713) 651-2350

Of Counsel:

VINSON & ELKINS
First City National Bank Building
Houston, Texas 77002
(713) 651-2350

Alpha Law Brief Co., One Main Plaza, No. 1 Main St., Houston, Texas 77002

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APPENDIX A A-1

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1980

NO. 80-1194

WEIDMAN METAL MASTERS CO., INC.,
Petitioner,

v.

GLASS MASTER CORPORATION
and FRED F. WILLSON,
Respondents.

On Writ Of Certiorari To The United States Court Of Appeals For The Fifth Circuit

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BRIEF FOR RESPONDENTS

RESTATEMENT OF QUESTION ONE PRESENTED

When a district court limits the claims to exactly the structure illustrated in a patent and holds the patent non-infringed and a Court of Appeals disagrees and construes the patent to teach an invention broader than the struc-

ture illustrated, is it proper for the Court of Appeals to determine that the broader construed patent claims are infringed by the accused structure?

ADDITIONAL STATEMENT OF THE CASE

The Court of Appeals interpreted the district court to limit the patent

> ". . . to a device with a resilient blade positioned directly over the roller." Weidman Metal Masters Co., Inc. v. Glass Master Corp. (CA5 1980) 623 F.2d 1024, 1028).

The Court of Appeals disagreed with this construction of the patent and held:

> "As we construe the patent, its crucial teaching was the relationship between the support roller and the knife blade achieved when the roller transfers force through the duct board to a knife resilient enough to react to that force. Neither the position of the knife in relation to the roller nor the source of the resiliency is crucial, although both are important, as evidenced by the inferior performance of the Weidman Machine. However, in regarding these factors as limitations on the patent and finding no infringement for that reason, the district judge erred." (supra 1030)

REASONS FOR DENYING THE WRIT

1. The Construction of a Patent is a Question of Law for the Court

The construction of a patent as a question of law was established at least as early as 1883 in *Winans v. Denmead,* 15 Howard 330, 14 L.Ed. 717 where the court stated:

> "On such a trial, two questions arise. The first is, what is the thing patented; the second, has that thing been constructed, used or sold by the defendants.
>
> The first is a question of law, to be determined by the court, construing the letters patent, and the description of the invention and specification of claims annexed to them. The second is a question of fact, to be submitted to a jury."

This principle has been followed without question for over 100 years. *Bates v. Coe*, 98 U.S. 31, 25 L.Ed. 68; *Coupe v. Royer*, 155 U.S. 565, 39 L.Ed. 263, 15 S.Ct. 199; *U.S. v. Adams*, 383 U.S. 39, 15 L.Ed.2d 572, 86 S.Ct. 708; *Gottschalk v. Benson*, 409 U.S. 63, 34 L.Ed. 2d 273, 93 S.Ct. 253.

2. Findings of Fact Based Upon Erroneous Legal Findings May Be Corrected on Appeal

In considering the trial court's findings of fact, the Supreme Court stated in a footnote to *United States v. Singer Mfg. Co.*, 374 U.S. 174, 195, 10 L.Ed.2d 823, 838, 82 S.Ct. 1773:

> "Insofar as that conclusion derived from the court's application of an improper standard to the facts, it may be corrected as a matter of law."

To the same effect are *United States v. General Motors Corp.*, 384 U.S. 127, 16 L.Ed.2d 415, 86 S.Ct. 1321; and *United States v. Parke Davis & Co.*, 362 U.S. 29, 4 L.Ed.2d 505, 80 S.Ct. 503.

3. The Supreme Court Has Consistently Held That Where the Appellate Court Construes a Patent Broader Than the Court Below, the Appellate Court Should Determine the Issue of Infringement of the Broader Construed Claims

In *Smith v. Snow*, 294 U.S. 1, 79 L.Ed. 721, 55 S.Ct. 279, the court below limited the construction of the patent to a particular arrangement of eggs and air flow in an incubator and held the patent not infringed. The Supreme Court construed the patent broadly and held the court below erred in so limiting the patent. The court then proceeded to apply the broadly construed claims to the accused structure and held it infringed.

This procedure has been consistently followed. *Brown v. Guild (The Corn-Planter Patent)*, 23 Wall 181, 23 L.Ed. 160; *The National Cash Register Co. v. Boston Cash Indicator & Recorder Co.*, 156 U.S. 502, 39 L.Ed. 511, 15 S.Ct. 434; *Consolidated Safety Valve Company v. Crosby Steam Gauge and Valve Co.*, 113 U.S. 157, 28 L.Ed. 939, 5 S.Ct. 513; *Morley Sewing Machine Co. v. Lancaster*, 129 U.S. 263, 32 L.Ed. 715, 9 S.Ct. 299; *Seymour v. Osborne*, 11 Wall 516, 20 L.Ed. 33; *Clough v. Gilbert & Barker Mfg. Co.*, 106 U.S. 166, 27 L.Ed. 134, 1 S.Ct. 188.

RESPONDENTS' REPLY TO PETITIONER'S REASONS FOR GRANTING THE WRIT

1. The Decision Below Does Not Directly and Irreconcilably Conflict With Decesions of This Court on the Determination of Equivalence and the Standard of Review for that Determination

In *Graver Tank & Manufacturing Co. v. Linde Air Products Co.*, 339 U.S. 605, 94 L.Ed. 1097, 70 S.Ct. 854,

the Courts below had both held the claims in issue to be infringed. *There was no disagreement between the Supreme Court and the lower Court as to the scope of the invention.* In the instant case the Court of Appeals reversed the District Court's ultimate holding of non-infringement, *because it construed the patent differently than the District Court.* Thus, the issues are completely different and there is no conflict between the decisions.

Having held the claims to be broad enough to include the infringing structure nothing would be gained by remanding the case for a determination by the District Court of the same issues decided by the Court of Appeals. The Court of Appeals correctly determined that the claims were infringed. *Smith v. Snow, supra.*

2. The Decision Below Does Not Directly and Irreconcilably Conflict With Decisions of This Court on the Necessity for Basic Factual Inquiries Prior to Resolving Obviousness

Petitioner relies upon *Graham v. John Deere Co.*, 383 U.S. 1, 15 L.Ed.2d 545, 86 S.Ct. 684. The *Graham* Court did not remand the case for findings by the trial court. It defined the invention and decided the issue of validity based upon the record before it.

As in *Graham*, the Court below in this case defined the invention, it considered the prior art as presented by Petitioners, it determined the difference between the prior art and the claims and ruled the invention not obvious to a man skilled in the art.

There is no requirement in *Graham* that an Appeals Court remand a case for additional findings of validity. The Appeals Court in the instant case followed exactly

the procedure of the *Graham* Court and there is no conflict in the two decisions.

To follow Petitioner's suggested procedure would result in a case traveling between the Trial and Appellate Courts several times before final judgment, as each instance of disagreement on one issue would require a remand for consideration of all related issues.

3. The Decision Below Does Not Conflict With the Decisions of Other Courts of Appeals On Equivalence and the Standard of Review of a Trial Court's Determination as to Infringement and Equivalence

4. The Decision Below Does Not Conflict With Other Fifth Circuit Cases on Equivalence and the Standard of Review of a Trial Court's Determination as to Infringement and Equivalence

5. The Decision Below Does Not Raise Significant and Recurring Problems Concerning the Appropriate Standard of Review of Determinations as to Infringement and Equivalence

The cases cited under these three propositions are not in conflict. In those cases in which tne Court of Appeals agreed with the lower Court in its construction of claims it affirmed the lower Court's holding as to infringement. Where the Court disagreed as to claim construction it reversed the District Court holding as to infringement. (See Appendix A for grouping of cases according to decisions.)

Ziegler v. Phillips Petroleum Co., 483 F.2d 858 (CA 5 1973) *cert. denied*, 414 U.S. 1079 illustrates the issue.

Two patents were involved. As to one patent the Appeals Court agreed with the trial Court's construction of the claims and affirmed its holding on infringement. As to the other patent the Court of Appeals disagreed with the trial Court's construction of the patent and reversed as to the issue of infringement.

An examination of each of the cases cited by Petitioner will reflect that only where the Court of Appeals disagreed with the District Court's construction of the patent did it reverse on the issue of infringement.

The cases cited by Petitioner follow the companion cases of *Smith v. Snow, supra,* and *Waxham v. Smith,* 294 U.S. 20, 79 L.Ed. 733, 55 S.Ct. 277 involving the same patent. In the *Snow* case the Court construed the patent broader than the Court below and reversed as to infringement. In the *Waxham* case the Court agreed with the decisions of the two Courts below that the invention was broad enough to cover the petitioner's structure and noting that the evidence supported the findings below affirmed the holding of infringement.

Petitioner urges that *Kemart Corp. v. Printing Arts Research Laboratories, Inc.* (CA9, 1953), 201 F.2d 624 and other cases erred in holding that undisputed facts and clearly comprehendable structures render the question of infringement a question of law. *Kemart* cites and follows the teaching of *United States v. Esnault-Pelterie,* 303 U.S. 26, 82 L.Ed. 625, 58 S.Ct. 412 where the Court said:

> "We are not unmindful of the rule that where, with all the evidence before the court, it appears that no substantial dispute of fact is presented, and that the case may be determined by a mere comparison of structures and extrinsic evidence is not needed for

purposes of explanation, or evaluation of prior art, or to resolve questions of the application of descriptions to subject-matter, the questions of invention and infringement may be determined as questions of law." *Heald v. Rice,* 104 U.S. 737, 749, 26 L.Ed. 910, 914; *Singer Mfg. Co. v. Cramer,* 192 U.S. 265, 275, 48 L.Ed. 437, 443, 24 S.Ct. 291; *Sanitary Refrigerator Co. v. Winters,* 280 U.S. 30, 36, 74 L.Ed. 147, 153, 50 S.Ct. 9.

CONCLUSION

The Supreme Court has given ample guidelines as to the issues of fact and law in patent cases. The Court below, including the Fifth Circuit Court of Appeals in this case, are in harmony in their treatment of the issues of patent construction and infringement and are following such guidelines. The Writ should be denied.

Respectfully submitted,

M. H. GAY
VINSON & ELKINS
First City National Bank Building
Houston, Texas 77002
(713) 651-2350

Of Counsel:

VINSON & ELKINS
First City National Bank Building
Houston, Texas 77002
(713) 651-2350

CERTIFICATE OF SERVICE

The undersigned, attorney for Respondents, Glass Master Corporation and Fred F. Willson, hereby certifies that the foregoing Brief for Respondents, was served on Petitioner (the only party required to be served) this _____day of February, 1981, by placing a copy of it in the United States mail, first-class postage prepaid, addressed to Petitioner's attorney, Rodney K. Caldwell, c/o Arnold, White & Durkee, 2100 Transco Tower, Houston, Texas 77056.

M. H. GAY

APPENDIX A

CASES CITED BY PETITIONER UNDER REASONS 3, 4 AND 5 GROUPED ACCORDING TO DECISION

1. Cases Disagreeing With the Trial Court's Construction of the Patent and Reversing the Holding as to Infringement

Olympic Fastening Systems, Inc. v. Textron Inc. (CA6 1974) 504 F.2d 609, *cert. denied,* 420 U.S. 1004 (1975).

Georgia-Pacific Corp. v. United States Plywood Corp. (CA2 1958) 258 F.2d 124, *cert. denied* 358 U.S. 884 (1958).

Kemart Corp. v. Printing Arts Research Laboratories, Inc. (CA9 1953) 201 F.2d 624.

Kwikset Locks, Inc. v. Hillgren (CA9 1954) 210 F.2d 483, *cert. denied* 347 U.S. 989 (1954).

No-Joint Concrete Pipe Co. v. Harson (CA9 1965) 344 F.2d 13, *cert. denied* 382 U.S. 843 (1965).

Ziegler v. Phillips Petroleum Co. (CA5 1973) 483 F.2d 858, *cert. denied,* 414 U.S. 1079 (1973) (as to Patent No. 3,113,115).

U.S. Industries, Inc. v. Otis Engineering Corp. (CA5 1960) 277 F.2d 282, *cert. denied,* 414 U.S. 1079 (1973).

2. Cases Agreeing With the Trial Court's Construction of the Patent and Affirming the Holding as to Infringement

Marino Systems, Inc. v. Cowhey & Sons, Inc., (CA4 1980) 631 F.2d 313.

Bolkcom v. Carborundum Co. (CA 6 1975) 523 F.2d 492, *cert. denied* 428 U.S. 951 (1976).

Farmhand, Inc. v. Lahman Manufacturing Co. (CA8 1978) 568 F.2d 112, *cert. denied,* 436 U.S. 913 (1978).

Calmar, Inc. v. Cook Chemical Co. (CA8 1964) 336 F.2d 110 rev'd *Graham v. John Deere Co.,* 383 U.S. 1 (1966).

Del Francia v. Stanthony Corp. (CA9 1960) 278 F.2d 745.

Moon v. Cabot Shops, Inc. (CA9 1959) 270 F.2d 539, *cert. denied,* 361 U.S. 965 (1960).

Price v. Lake Sales Supply R. M. Inc. (CA10 1974) 510 F.2d 388.

Burger Train Systems, Inc. v. Ballard (CA 10 1977) 552 F.2d 1377, *cert. denied,* 434 U.S. 860 (1977).

Studiengesellschaft Kohle v. Eastman Kodak Co. (CA5 1980) 616 F.2d 1315 *cert. denied* No. 80-546 (Dec. 1, 1980).

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